

TQM Volume-5

Total Quality Management in Factory Management

*The KJ-Method, Brainstorming
& Cost Control-7.*

2023a Edition

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Factory Management Institute

COOPERATING TO REACH EXCELLENCE



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At the time of publication and over the age of 80, he continued working on disseminating original Japanese methods and more knowledge; even the one learned from the pioneers. He has been an international consultant for the last 30 years in more than 11 countries, training clients, as a lecturer and writer. Even now, experimenting, researching innovative methods, and growing in the field of Production Management and Corporate structuration.



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The third level of the Issue provides more clearness to the structure of the text to the more relevant.



Lower levels of the Issue, commonly 6th or 7th, and, pointing out necessary explanations about pictures or graphs.

UPDATING TABLE:

Date, Version-Previous & V-Next	Chapter (I..XX...)	Chapter Point.- sub-point : (Updating)

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I. Prologue

I have already written the KJ Method once time. But once again, I would write about it.

Why? ...First, KJ is an essential technique for the era when is more and more required a creative thinking environment in the era of AI.

As I wrote before, the era is AI (and IoT, Robotics and Meta). The capacities which humans are required are **Kaizen** and Creative Thinking (and Negotiation: face-to-face communication).

Kaizen is to improve better. And Creative Thinking is newly generating Ideas. These two capacities are truly required by the era.

Another reason is it is difficult to do it (KJ), even though the method and process are known.

Additionally, I need to tell you a little shocking thing. Brainstorming? In most cases, it is not useful. Face-to-face communication including meetings, there is also a barrier to the creative process.

Diversity? ...I recommend it anytime. But I need to tell the real and true (which is the meaning of "effective") diversity.

Please understand, that I never deny Brainstorming but suggest using it under the recognition of such difficulties in the deployment of the KJ-Method.

First, let's review the KJ Method. What is KJ? ...Based on these 2, I would write KJ again.

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II. KJ-Method

First, let's review the KJ Method. I remind the content already written about the KJ-Method on 03-Feb-2014. Thus, what is KJ? ...I got a question about the KJ method and wish to introduce this technique.

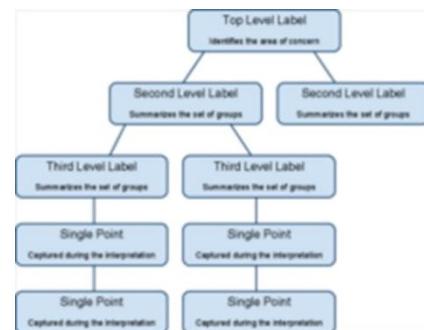
KJ method was devised by Jiro Kawakita (Anthropologist and professor of Tokyo UV) and is a good thinking method and the basis of the Affinity diagram method which is one of the New QC 7-Tools.

Affinity diagram method, Association diagram method (Relations diagram), System diagram method (Tree diagram), Matrix diagram method, Arrow diagram method, PDPC method (Process Decision Program Chart) and Matrix data analysis method.

And about the Affinity diagram, there is an explanation by Wikipedia below:

Affinity wall diagram: An affinity diagram is a business tool used to organize ideas and data. It is one of the Seven Management and Planning Tools. People have been grouping data into groups based on natural relationships for thousands of years; however, the term affinity diagram was devised by Jiro Kawakita in the 1960s and is sometimes referred to as the KJ-Method.

The tool is commonly used within project management and allows large numbers of ideas stemming from brainstorming to be sorted into groups, based on their natural relationships, for review and analysis. It is also frequently used in contextual inquiry as a way to organize notes and insights from field interviews. It can also be used for organizing other freeform comments, such as open-ended survey responses, support call logs, or other qualitative data.



But "Sometimes referred to as the KJ-Method", it is wrong and misunderstanding. And KJ is not equal to the Affinity diagram. However correctly, the Affinity diagram method is one of KJ's uses. To get your good understanding, I show some KJ-Method used examples.

Example-1 (Aggregation Thinking KJ). To summarize thinking.

When I wrote the 5Ss, I used it to summarize my thoughts.

I made the diagram for thinking and describing the 5S. For thinking 5S, I wrote 118 cards and summarized 60 small islands and 22 large islands. Based on this diagram I wrote a 120-page 5S¹ explanation which I shared with you.

¹ 5S-1 [eng]: <https://archive.org/details/5s1eng>

The steps are next:

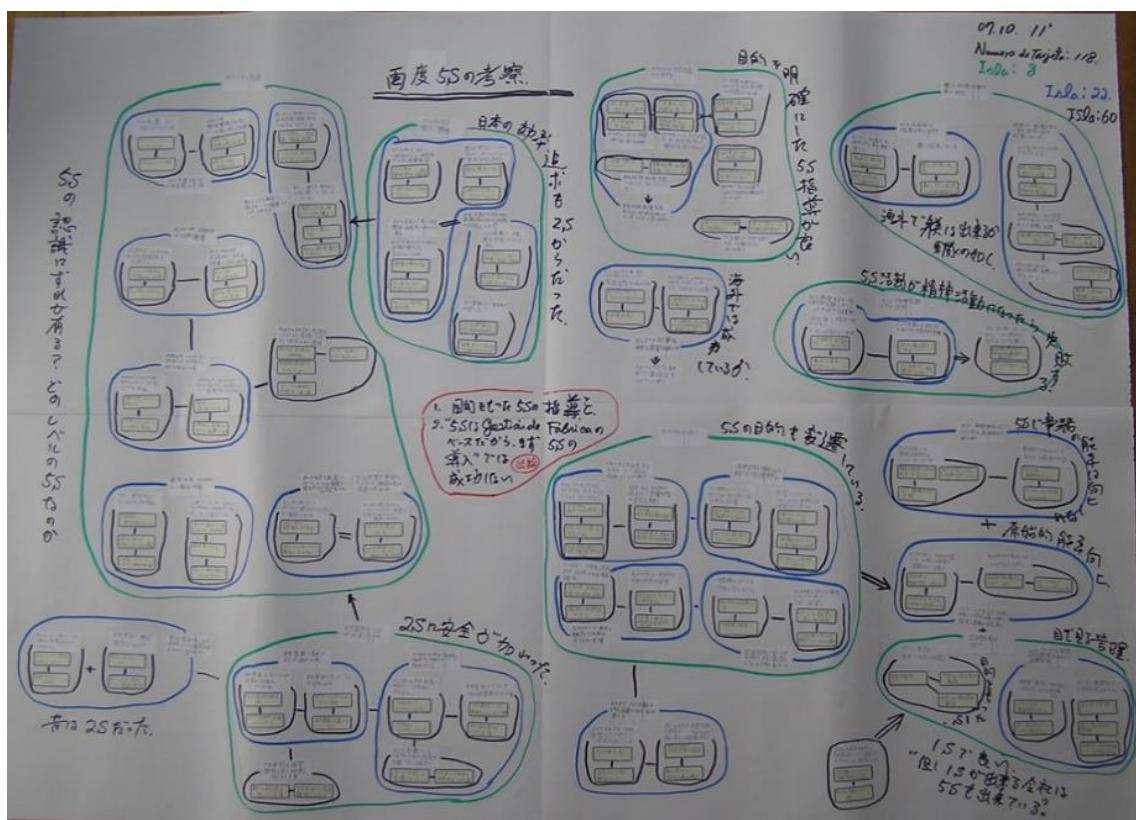
1. Deciding theme. (In this case, 5Ss), Preparing Labels to write ideas.
2. Label Okoshi (Writing ideas in labels).
3. Break and go out to stroll.
4. Repeat the 1, and 2 processes for increasing cards. Of course, duplicated cards (labels) are many.
5. Make a bird's-eye chart.
 - a. Gathering the same or similar ideas and clipping.
 - b. On the top of labels, titling. It is the making of small islands.
 - c. Labels arrangement on the sheet (I call, Spatial Arrangement)
 - d. By thinking about the relationship of each small island.
 - e. Making medium islands and titling labels.
 - f. Pasting the labels and enclosing them with lines.
 - g. Drawing with a line to show the relation of islands.
 - h. Making large islands and titling (It is the tables of contents).
 - i. Let's look at the example below...



5S-1 English by Koichi Kimura



5S-2 English by Koichi Kimura



5S-2 [eng]: <https://archive.org/details/5s2eng>

5S-1 [esp]: <https://archive.org/details/5s1spa>

5s-2 [esp]: <https://archive.org/details/5s2spa>

This case is used for thought organizing but is not the case for idea generation. One of the epitomes of KJ is Creative Thinking.

This case is the same as the next Case-2 Affinity Diagram. And I used it to organize my thoughts.

Example-2 (Affinity KJ) Understanding the company's problems.

When I taught the Affinity diagram to my students, I taught it with the name PPM (Potential Problem Map). Below is its story.

And using the case of Affinity KJ (Affinity diagram), I would explain the procedure of KJ.

The title was **Potential Problem Map**.

The next photo is an example of the utilization of this method for deciding the theme of QC Circle (Opinion aggregation). This is completely the same approach as the Affinity Diagram.

When beginning the activity of (for instance) QC Circle, it is necessary to decide the theme and target figures logically based upon the company's policy, preliminary investigation and study of the figures and current situation of the production line.

Then the members (5 **Gemba-workers**) and the QC trainer made up the next diagram.

Throughout this QC Circle introduction, I could train and gained 4 very good trainers. In this case, this group used the diagram to choose the theme.



This group made this large KJ diagram in Total 157 cards, 71 small, 21 medium and 7 large islands

Card play with a trainer. In this case, this group used the diagram to choose the theme

I describe the rule of this method later. I quite often use the method for summarizing thoughts and clearing ideas and also making up the team play.

This case is used for thought organizing, but it is not the case for idea generation.

Next, I would explain the Affinity Diagram through the example of this Gemba team, who decided on their QC Circle theme with KJ.



Affinity diagram

A little deviate from KJ, I would explain the Affinity diagram.

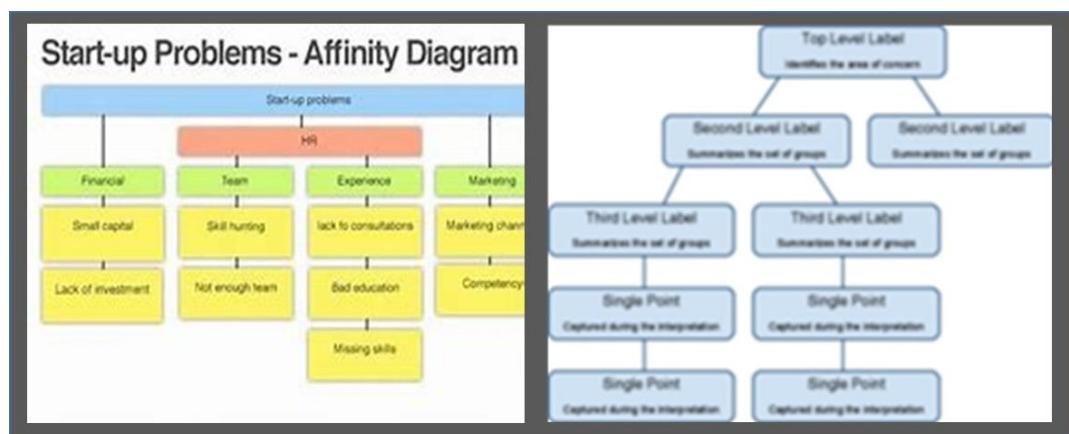
Thus, what is an Affinity diagram? ...The affinity diagram is a technique that finds the "affinity" between facts, opinions, and ideas for a given problem and creates an integrated diagram. It is considered an effective method in quality management and field improvement where it is common to encounter situations where the outline of the problem to be improved cannot be grasped and it is difficult to proceed with the solution. It is also commonly used to analyze the strengths and weaknesses of a company's products or for self-analysis during company training sessions.

Again, Affinity diagrams are useful in the following situations:

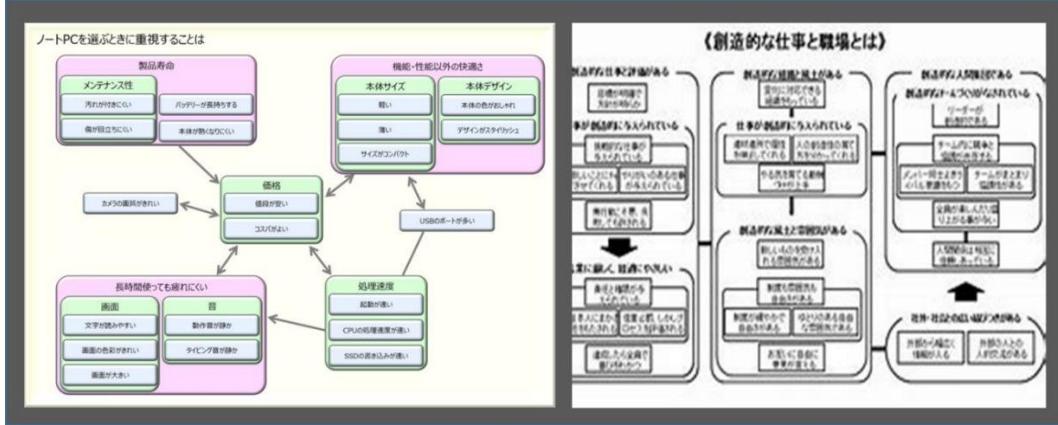
- When analyzing large amounts of data
- When looking for solutions to difficult problems
- When classifying and aggregating many ideas by theme
- When visualizing and processing information
- When working together to come up with solutions

First, let's see the example of an Affinity Diagram in English SNS.

I requested Bing with the next sentence: "Let me see a good example of an Affinity Diagram." Then, many examples are introduced. The next two are two of them.



I say very frankly, and these are no good examples (very poor), and probably cause a misunderstanding to readers. Then, I tried a Japanese SNS:



These from above seem just better.

Please understand just images of better examples and poor ones. If Wikipedia says using KJ, the affinity diagram should use its good points. However, the Japanese SNS shows some better examples, and they have the cards and islands. These are the better points, but not the best.

Why card used is better? ...I'll explain deeply later.

Soon (I'm writing this column in April of 2023) the work of making affinity diagrams will be shared by humans and AI. Human creates element ideas. AI lays out the element ideas by his thought of affinity.

Yes, the person to is lazy and likes to cut corners will entrust this important work (judgement of affinity) also to AI. So far, there are no examples of affinity diagrams by AI. However, it is just a matter of time. The lazy person will leave the important process (deciding affinity) to AI. Is this a bad thing?

What is affinity? ...A dictionary says next: "Affinity refers to a natural liking or attraction to a person, thing, idea, etc. It can also refer to a natural tendency or ability to use or do something".

What an ambiguity it is! ...Isn't it? ...It is indeed human and subjective. Is it possible for such subjective matters to leave for AI? ...It is indeed acceptable.

When making the process of affinity judgement by humans, it is acceptable for the persons to judge the affinity between cards (ideas) by simply "same, similar or somehow".

This degree is acceptable and also (this point is essential) a vague process to be one of the zest of KJ. However, if I say one of the difficulties for AI is "somehow (human intuition)".

Do I use the AI Affinity diagram when it is established? ...Yes, I do. Thus, EXCEL can be used to draw diagrams. But it hasn't the function of AI which judges the affinity of the cards. Once again, so far AI hasn't the function of the Affinity diagram.

Do I recommend using it? ...No, I don't. I recommend doing it manually and enjoying the "benefit of inconvenience".

Affinity diagram process

The affinity diagram process lets a group move beyond its habitual thinking and preconceived categories. This technique accesses the great knowledge and understanding residing untapped in our intuition. (If you can do it truly. And the easiest way is to use KJ.)

I would introduce a story of **Quality Kaizen** in a company.



Quality Kaizen.

Yes, it is. This company was concerned about product quality. Then, my group challenged me to show the way and to resolve it. On the other hand, I also had the purpose of bringing up some instructors.

Bringing up of instructors? ...Yes, it was the **Kaizen** instructors. Fortunately, I got very much excellent 4 samurais who were constituted of 3 ladies and one guy. This story is the activity of this group. Thus, let's look at the affinity diagram process in this group KJ activity. And, to identify the quality **kaizen** itinerary, I taught the PPM method.

PPM method? ...What is this? ...**PPM – Potential Problem Map** is an Affinity diagram made under the KJ-Method. Thus, roughly, I tell the total story:

- 1- First, establishing a QC group with Gemba-Operators and my group.
- 2- Second, making the Potential Problem Map - PPM.
- 3- Third, deciding the target item to improve process quality and QC Circle activity.

In this episode, I write just affinity diagram making. And in the later episode, again I use this story for QC Circle description.

- 1- 1st: Establishment of QC group. I omit.
- 2- 2nd: Making PPM: Next is the complete diagram (left) and label **Okoshi** by Gemba operators.



This group made this large KJ diagram in Total 157 cards, 71 small, 21 medium and 7 large islands

Card play with a trainer. In this case, this group used the diagram to choose the theme

- 3- 3rd: QC Circle deployment: I show just the final QC Circle presentation by operators.



In this case, this group used the Affinity diagram to identify the potential quality problem and also to show the steps. As you understand, small islands are the targets to resolve. And this group was challenged to resolve one island.

Well, let's look at the step of the KJ Affinity diagram: The group summarized the production Gemba problems (Potential Problem Map) by KJ and decided on their QC Circle activity theme.

I taught the MPP (Potential Problem Map) method. And, yes, I taught the Affinity diagram with the name of PPM (I would exactly explain the rule and procedure later.) And the 9th rule is next.

9. Any card never be disposed of, and also even the same ideas.

This rule is very important because of the next 3 things. One is that the number of cards shows the high of their interest. The second is to treat importantly any cards and anybody's. And the third is the chance of serendipity.

The number of cards is important. Because one of each card can be a chance of inducing serendipity, even though same meaning cards.

Please remember the students' association game. The question was "rain". And the students wrote the associated words. Someone wrote the word "umbrella" on a card. Someone wrote "universe". Someone wrote "apple". And, such free imagination is important for KJ and Affinity diagram.

Well, let's look at the procedure of the Affinity diagram in their KJ activity. And, for your good understanding, I introduce a case. This company had chronic quality troubles. Then, one group was established which consisted of 4 trainers (my students) and 3 Gemba workers. (It was a little many as making KJ. But it was a training course of KJ.)

To identify and recognize the company's quality situation, we started to make the quality problem affinity diagram (in the case of PPM: Potential Problem Map). But if starting a dialogue like "let's speak about the company's quality problem", it is too difficult. Therefore, we chose one of the main products. By digging (quality) problems deeper in one case, it is possible to consider more easily than vague total.

Please never misunderstand that KJ doesn't equal affinity diagram, just because the affinity diagram method is just one of KJ's utilization.



PPM – Potential Problems Map Steps

Index of the theme:

0. Deciding the theme;
1. Prepare Cards, Pens, Photos, Sketches and A large paper;
2. Labels (Cards) **Okoshi**;
3. Collecting all cards and mixing (completely) and distributing them to all members;
4. Making pair cards with clip (and Spatial arrangement);
5. Displaying cards on the white paper and paste them;
6. Making middle-sized islands constructed of 2 to 3 small islands;
7. Drawing large islands in considering the affinities between the middle size islands;
8. Naming (titling) the large-size islands;
9. Re-confirmation and documentation (for action plan).

0. Deciding theme:

This group challenged to resolve the company's problem. But there were problems which were not clear and vague. Anyway, they need to narrow these down to one for sure success.

- Establishing group: 1 group, maximum 5. (If many, divide into 2 smaller. In my experience, min 3 and 5 max)
- Deciding leader (facilitator) who is responsible for managing the meeting.

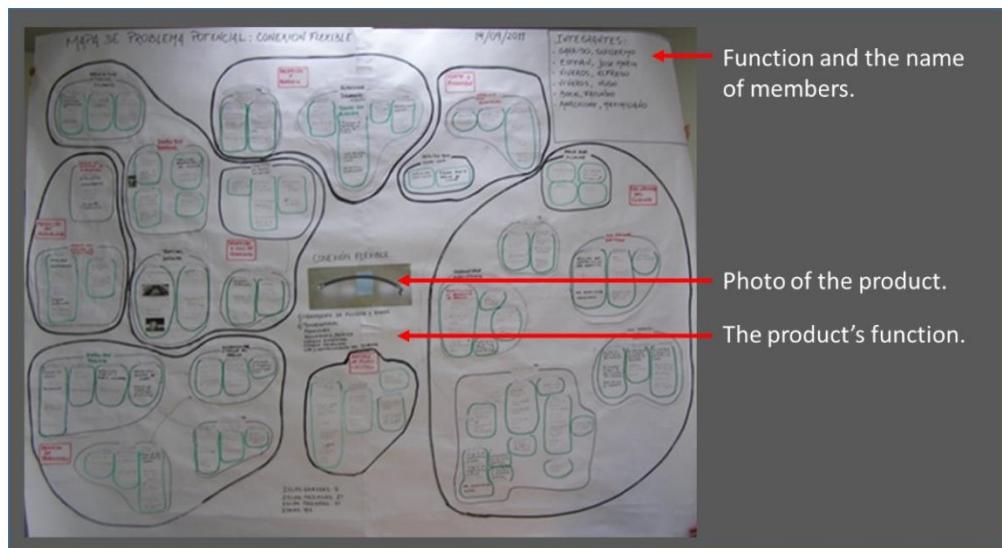
And, they started KJ activity...

1. Prepare Cards, pens, photos, sketches and large paper.

Rules:

- Cards: Possibly, prepare several sizes of cards for writing.
- Large white paper preparation.
- The rule is as next: **One card one idea.** Clear, concise and short sentences. (Read and understood by other members). But never one card two ideas.
- Simply writing.
- The writing is not a word but should be a sentence.
- Don't avoid individual subjectivity.

Next in the paper: Title (in this case: Potential Quality Problem Map) and the Date, and names of the group members. Next, is the completed drawing.



(Above is the completed drawing. Of course, when they start, there are just titles, names and photos.)

2. Labels (Cards) *Okoshi*

Called Labels *Okoshi*; Digging up labels (cards).

10 to 30 minutes/one cycle for creating ideas and writing cards by the group members.

It is the most important process for creating ideas.

The homework is also welcomed, just because the activity ground is not just a meeting room, but a factory all area. Gathering information is not just in the brain, but includes hearing from accountants, factory supervisors, operators and all processes. (Normally, this activity time is shortened, because of the member's diversity.)

Thus, Why express the ideas with simplicity? ...Human has subjectivity. This subjectivity also cannot be avoided. The person who wrote the card has subjectivity, and other members also listen and understand their subjectivity. Thus, we cannot escape from subjectivity. But in my KJ, subjectivity is accepted in diverse conditions and also is an interesting point of this game.

The points of doing the card's activity.

- Write more concrete in
 - When, where,
 - The concrete name of the problem.
- Investigate each divided part.
When doing KJ meetings using cards, it's a good idea to ask each person to write (for example) 50 or more ideas in a limited amount of time (it is called the forced idea method). And the limited time is fixed and not done on a large scale.
The most important thing at this stage is the card number (number of ideas). Potential problem: As an example, let's take the potential source of product defects:



Take notes on ideas on paper or cards directly. The ideas taken notes are transcribed to cards. (In this case, writing out the potential problems for product quality)

This step takes a long hour, because of visiting Gemba with a camera and notebook to record ideas. In some cases, it is required the homework (expectation of serendipity). Anyway, it requires several ideas as much as possible. Using photos and sketches are recommended to increase the associations, idea and record.

We make and ask easier way what defects could be supposed (in each part of the product. FMEA also requires the defects could be supposed.)

Anyway, the most important is the number of cards (potential defect name).

3. Collecting all cards and mixing (completely) and distributing them to all members.

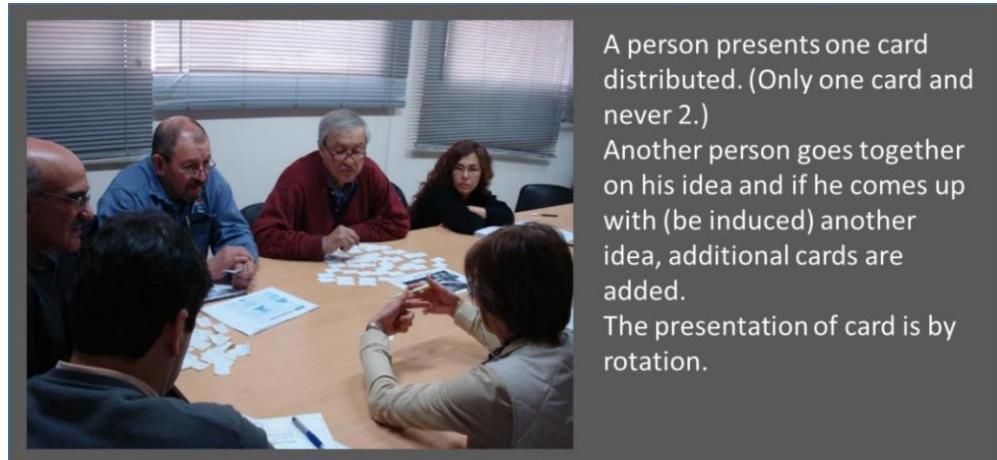
The cards are read aloud (introduced) by individual members.

But I recommend gathering and mixing all and then reading aloud the cards by other persons. Cards are read aloud by all members one by one and in order.

- The member is required to read aloud.
- Then the card read is put on the table.
- If it is not understandable, the member to whom the card is written is required to explain. But never deny it.

And any card never be disposed and also even same ideas.

- Create (Induce) more ideas by Brainstorming (a little exaggerate) or short discussion. And additional cards are written. Thus, additional cards are induced and then put on the table.



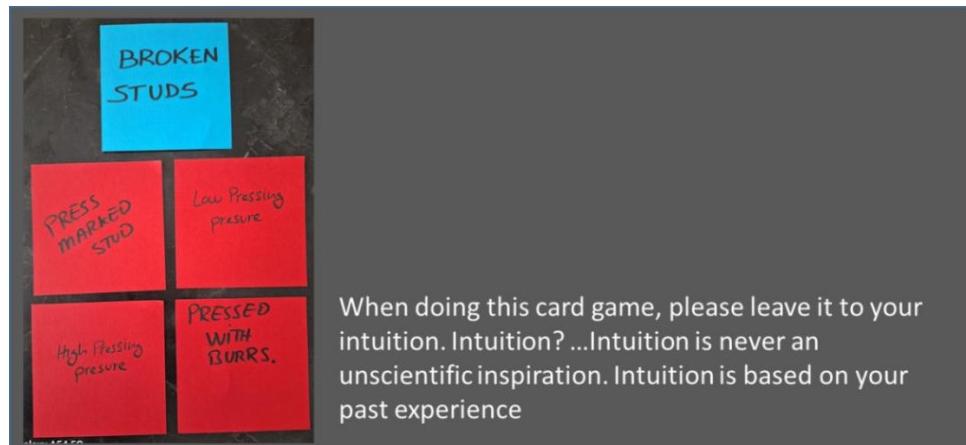
4. Making pair cards with clip (and Spatial arrangement)

When reading aloud, discuss other affinity cards and display them close and side by side. The pairs of cards become the smallest islands.

The cards (temporarily I call as "base cards") are read up in order and displayed and put on the white large paper.

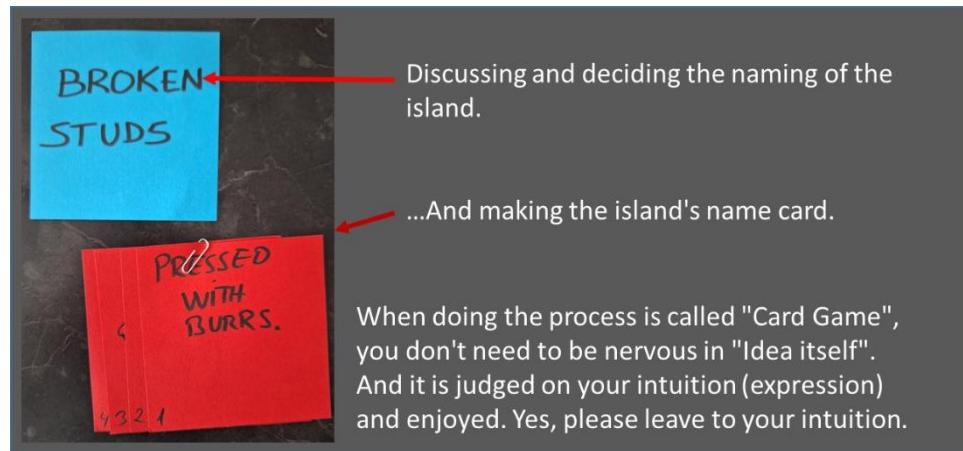
- Reading up one by one-by-one person and displaying them on the white paper.
- Affinity diagram. The facilitator demands all members to search for cards having affinity to the base card and show them.
- Affinity diagram. If some cards feel affinity to the base card, choose one card (or 2) to make a pair with the base card. A little to be high level, if there are same meaning cards, not to let them gather, but use them separately. And each card is used for other affinity idea islands.

I do recommend doing so to induce more ideas. The above example was gathered in one of the same ideas in plural cards. As it's the first experience for them.



Other cards should be used for other occasions. Even if other cards feel the affinity, don't add and keep 1~2 cards adding. These other cards must be used for making other islands.

- Titling to the pair cards.
Deciding the titling (naming) of the islands which is the smallest unit of the island).
Discussing and choosing the most suitable title.
Clipping these 3 cards with the title on top.
- Repeating this work
- And facilitator displays these pare cards on the white paper.
Then...
- Pair affinity cards clipping (I call "card game").



- Naming the (smallest) island.
After the clipping of 2 cards, it is necessary to name (titling).
This work is also made with members' intuition and debate. And it is quite natural to have "some opinions".
Then the important rule is never to neglect or compromise the opinion.
So, please remember the rule:

"(9) Any card never be disposed and also even same ideas."

This rule is applied in this step too. So, what should we do? ...Transcribing the 2 cards and making a new island with the second title. If there are 3rd and 4th title ideas, it is necessary to transcribe the 2 cards' contents and create the 3rd, and the 4th island.

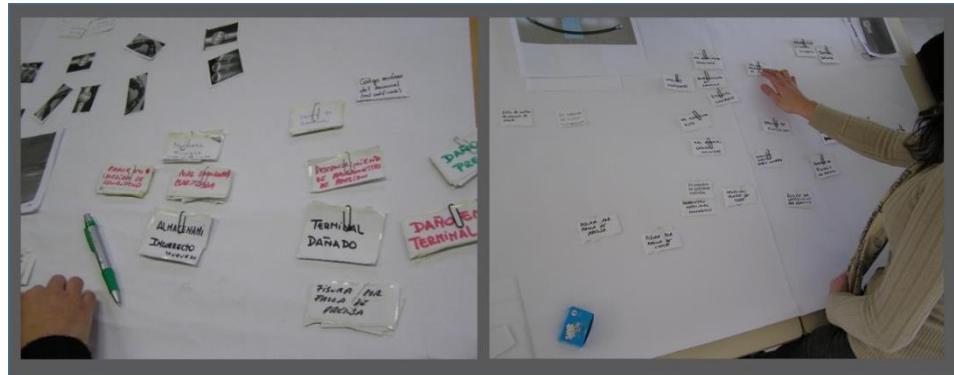
Please understand 2 things: Firstly, it is happening different opinion about the titling is very much welcomed. And secondly, it is welcomed to increase islands.



Creative Thinking in the KJ-Method

If making Creative Thinking in KJ, adding just one card which is unintentionally read, and making the island. And create unique ideas from the combination of different ideas.

Just this point (making small islands with "unintentionally read, and making the island") is different from Affinity KJ. Of course, Ideas piggybacked on are welcomed. And anyway, increase the number of cards.



5. Displaying cards on white paper and pasting them.

Lone wolf also should be displayed in the sheet as one of the islands and ideas. Again, look at the affinity pair cards, then clip on & put a title card which shows the simple Affinity word.

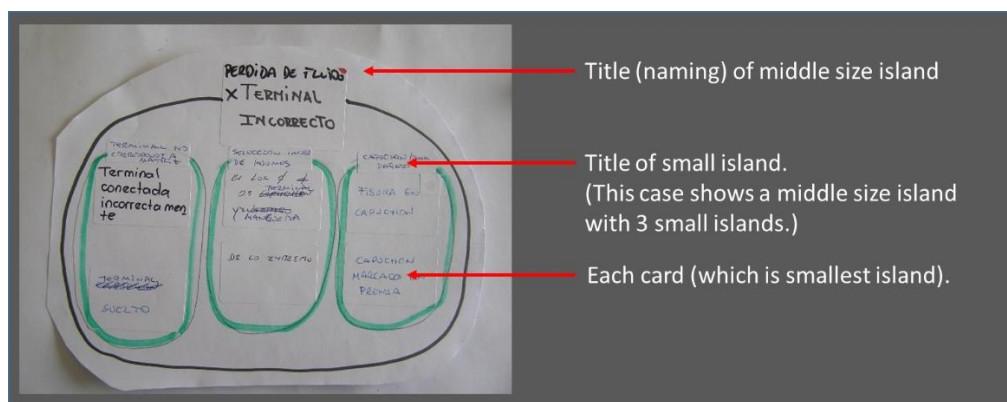
Before pasting cards clipped (small islands), it is considered the affinity between the small islands each other. Next, remove clips and paste cards. And then draw the middle-size islands. It is also okay to move a note someone else has already moved.

If a note seems to belong to two groups, make a second note.

Tips: It is very important that no one talk during this step. The focus should be on looking for and grouping related ideas. It is also important to call these “groupings.” Do not place the cards in an order or determine categories or headings in advance.

6. Making middle-sized islands constructed of 2 to 3 small islands.

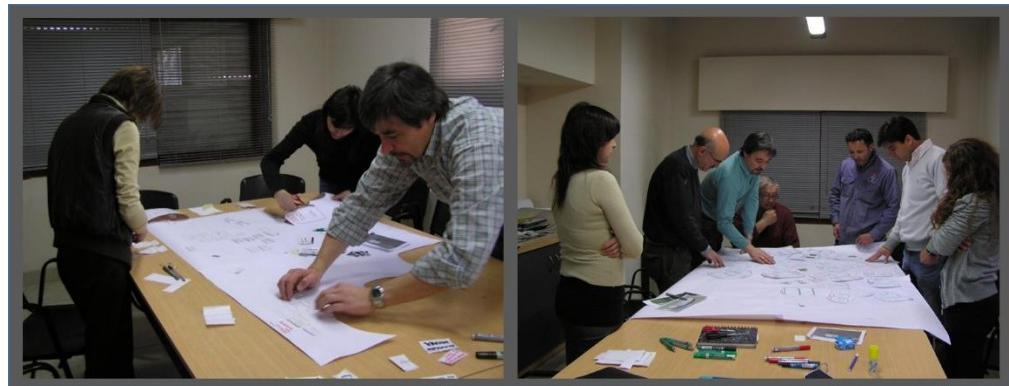
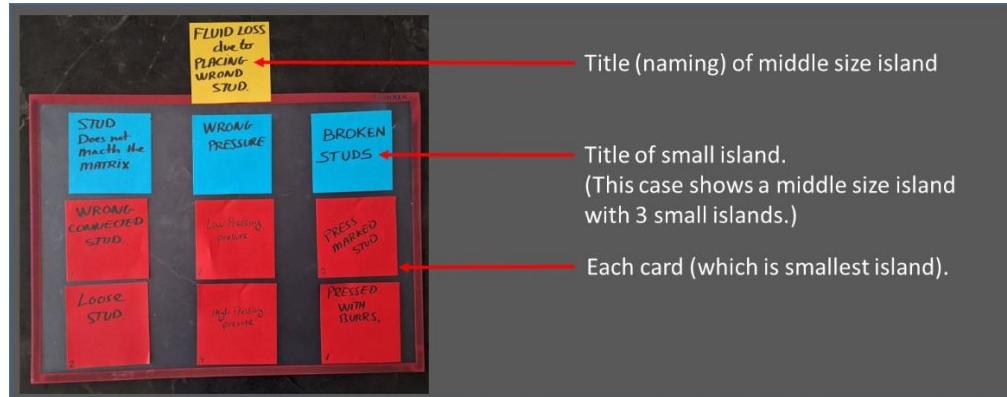
Then these middle-sized islands are given their short sentence titles.



When titling, normally a debate in Brainstorming is made.

But I don't recommend its style and recommend to be written cards by all members. All members write their individual thoughts, rather than Brainstorming. After writing cards, and doing mini KJ with cards, the title is chosen or written new title card in all members' agreement.

Now one of the important things is that a leader is not necessarily, but a facilitator. Because it is not allowed to lead the meeting direction by his/her thoughts.

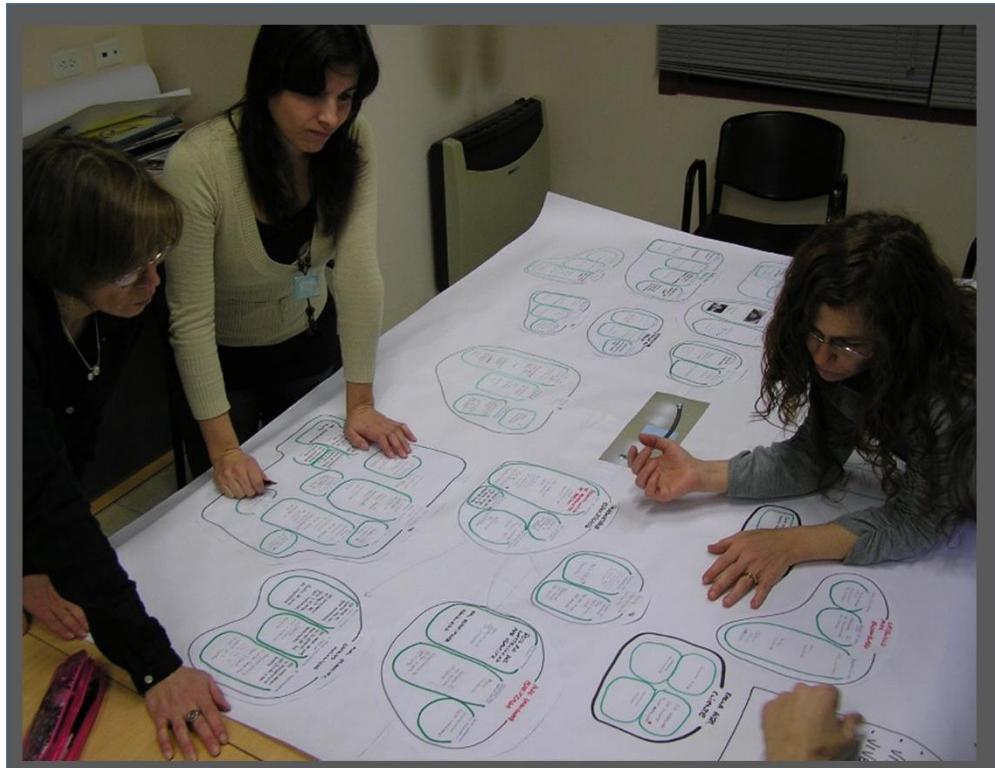


Huh!? ...They are cutting out the medium size islands! (the left picture)

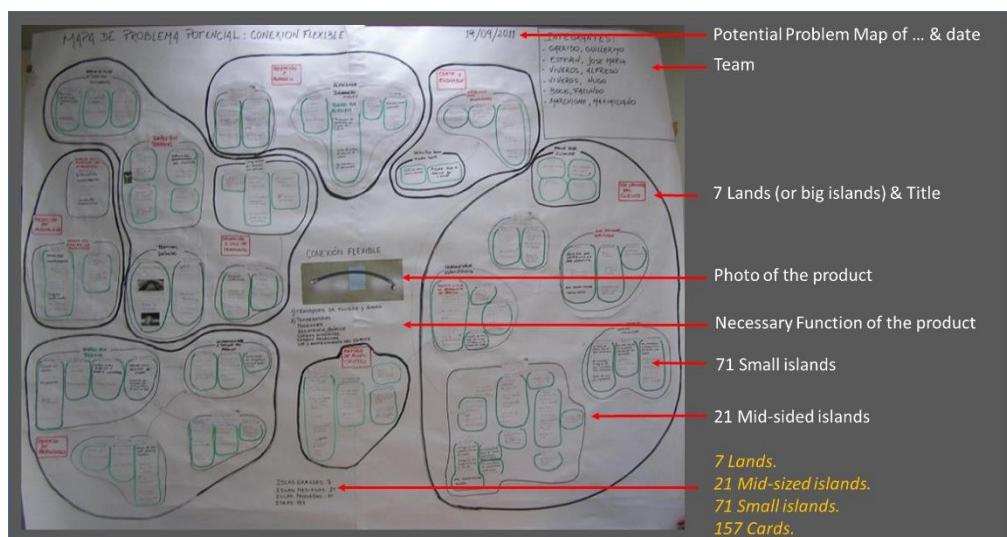
Why? ...It is recommendable if you are a beginner of KJ or affinity diagram. Each middle-sized island is considered as one island. Then it is considered the affinity of each other. The cards were already pasted. However, it is necessary to consider flexibility. Then cutting out the middle-size islands and considering the layout in affinity with each other is a good idea.

Then re-layout the middle-size islands in considering the affinity. And the relation lines are drawn to identify between the middle size islands.

7. Drawing large islands in considering the affinities between the middle-sized islands.



8. Naming (titling) the large-size islands.



Of course, titling (naming) which shows the contents of the islands in simple and concise sentences is an important process. And it is never led by a specific person, but facilitated by a fair person recognized.

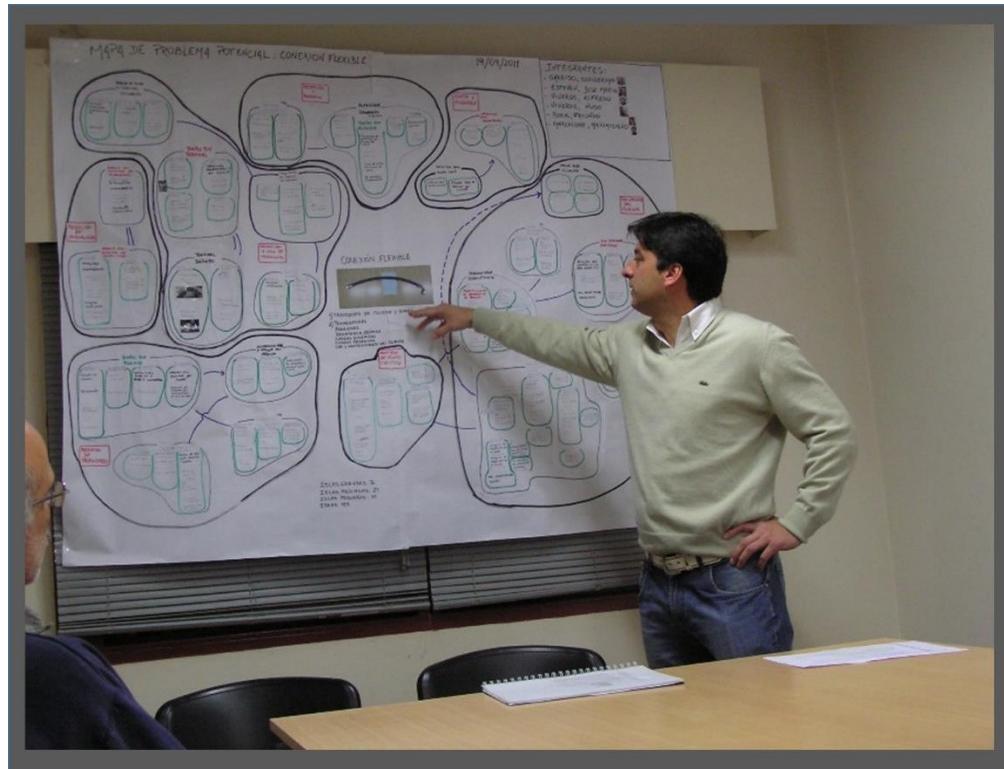
9. Re-confirmation and documentation (for action plan).

Affinity diagram one of bird's eye view and is a tool of deep consideration identifying problems which are vague and complicated and also difficult to represent with numbers. And it is used for strategic thinking about quality problems, safety, human relations, sales issues and others.

It is never difficult to build up it, but easy with a KJ activity. And it (building up the diagram) is just a start line. So please, migrate to **Kaizen** implementation.

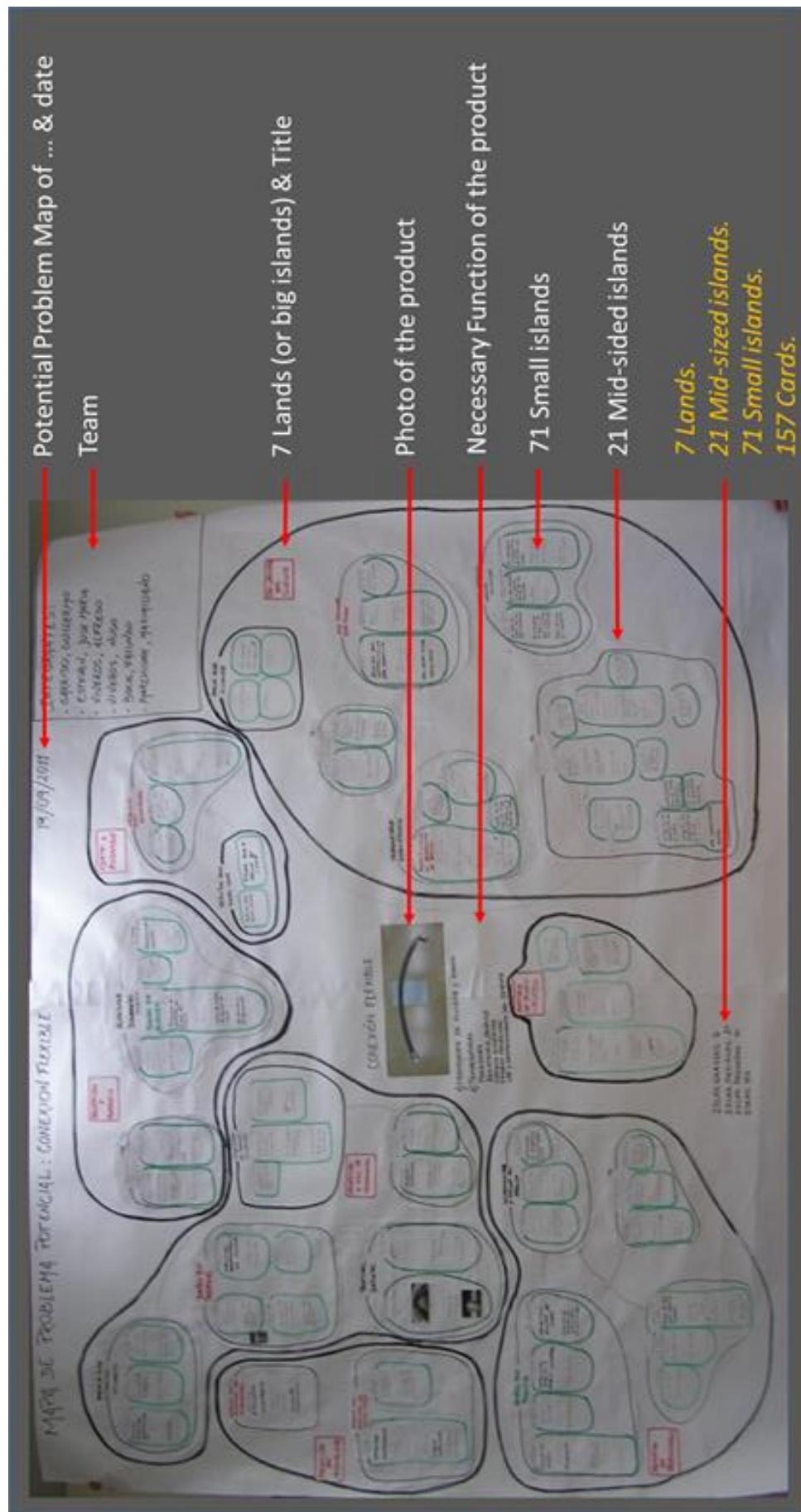
They documented it. And then the action plan was made. This group intended to resolve the quality problem of the company. And to identify the quality situation, they chose one product and tried to dig deeply into the root causes. Then they chose one middle-sized island as the theme of QC Circle.

This continuation will be presented in the column of QC Circle.



This Affinity diagram (PPM; Potential Problem Map) is one of the utilizations of Group KJ.

Speaking of which, the case of "Aggregation Thinking KJ" also it possible to be called an Affinity diagram in one person. We explain it in the next point.



Example 3: Creative Thinking in KJ

I deeply explained the method of the Affinity diagram in KJ. And the detailed step introduced has 9 steps.

In reality, Cases 1, and 2 show the cases of discovering and doing Seiri &Seiton about the things which are "potential things" or "existing things". Thus, you can understand, can you? ...PPM also shows the possibility by current condition. Or, in other words, it is possible to say, "Finding existence from existence".

But Case 3 is different and is "Creating existence from nothing".

I explain it this Case 3 which is the (I believe) strongest Creative Thinking (I call Creative Thinking KJ).

"Creating existence from nothing"? It is a little exaggerated expression. But please accept it for your better understanding.

Let's look at this case.

In case 2, I explained the Affinity diagram in KJ. And the process of this Creative Thinking in KJ also same steps excluding three processes.

Once again the steps of the Affinity diagram in KJ are next:

0. Prepare Cards, pens, photos, sketches and large paper.
1. Labels (Cards) Okoshi
2. Collecting all cards and mixing (completely) and distributing them to all members.
- 3. Cards are read aloud by all members one by one and in order.**
- 4. When reading aloud, discuss other affinity cards and display them close and side by side.**
- 5. 2 pairs of affinity cards clipping (I call "card game").**
6. Naming the (smallest) island.
7. Displaying cards on white paper and pasting them.
8. Making middle-sized islands constructed of 2 to 3 small islands.
9. Drawing large islands in considering the affinities between the middle-sized islands.
10. Naming (titling) the large-size islands.
11. Re-confirmation and documentation (for action plan).

As above, the different processes of Affinity diagram KJ and Creative Thinking KJ are the 4th and 5th steps.



Creative Thinking KJ

If I can show the example of the case of product development, it may be the best.
However, I have no teaching experience in this case.

Therefore, I would explain it in the case of quality improvement.

3. Displaying randomly all cards on the paper. (No consideration of affinity, and anyway at random.)
4. Combining 2 cards next to each other. (Again, no consideration of affinity, but randomly).

Example of a quality concern of a **Machining Centre**.

And as usual, the group was making an MPP (Potential Problem Map; But not an Affinity diagram, but Creative Thinking KJ). This activity was made in the training **camp style (3 days)**. And the thinking and debating places were in the office meeting room, the production Gemba, Outside and the bench. Of course, the occasion of thinking alone for **Label Okoshi** was prepared.

The group members who constituted of 5 persons were given the Norma (quota) which was more than 50 cards by one.

1st process (Label Okoshi)

Then, as a result, a total of 310 cards were written.

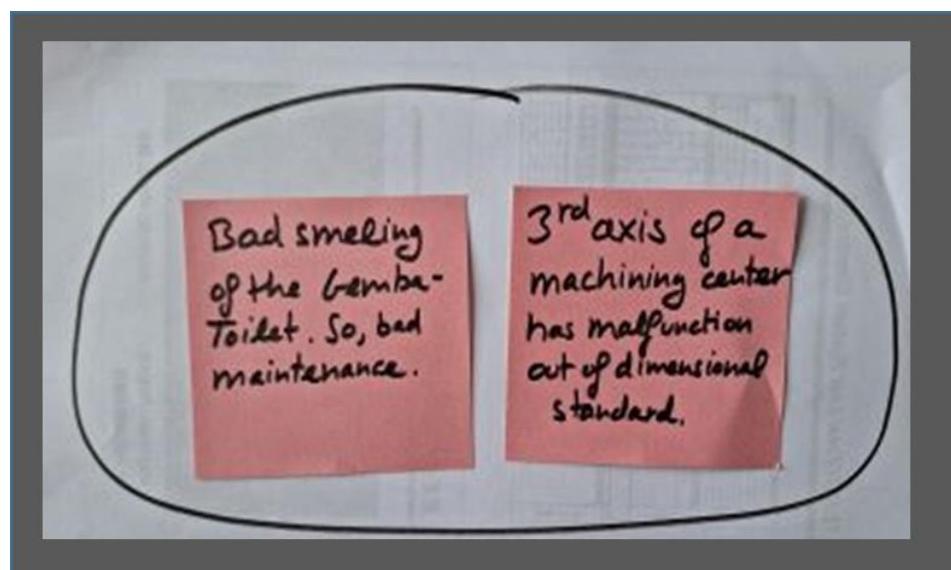
Again and again. Cards are written (Label Okoshi) in 2 rules: Firstly, simple & concise sentences (understood by anybody). And secondly, One idea in one card.

Now, I would explain the Thinking KJ with 2 cards.

2nd process.

Pairing with 2 cards. All cards were collected and mixed completely. And distributed to all members almost (about) the same number of cards.

The facilitator requires person by person to read aloud one card (first base card). The card read aloud is laid on the white paper. And the next person read aloud a card (not considering the affinity, but at random, top mixed card) and lay beside the base card. The 2 cards were as below:



3rd process.

Making islands: 1st base card, 2nd base card, ... As you understand, logically 155 small islands are made (total cards; 310). But actually, this group made up this PPM with 127 small islands. Such a thing is also acceptable.

Now, above 2 cards. The cards are clipped with the title card. This process which considering, debating and deciding the title is the most enjoyable (but actually very hard) process. Let's look at this process a little.

After the base card (label) which says "3rd-axis of a machining centre...", the card "Bad smelling..." was read aloud.

Then, the card "Bad smelling..." was laid on beside the base card. And this pair of cards was clipped as one island. When 2 cards were displayed, there was the next conversation.

Then A member talked loudly: —Why such a card related to the quality of maintenance of the toilet was written? ...We are talking about the quality improvement of production quality. Therefore, the first card "3rd axis of machining centre..." has no problem. But "bad smell of toilet..." has no relation to the base card completely.

The facilitator speaks then: —OK, Ok. But everyone, please understand 2 rules: Firstly, any card must never be denied when displayed on the table. And secondly, anyway, it is required to conceive an idea by combining 2 cards. These are strict rules. Well, let us conceive imagination what is a suitable title (naming) sentence. Come on your idea, come on. And please write your sentences on the card. Oops, I forgot the 3rd rule:

—The 3rd rule is nobody is allowed to escape from making an answer —the facilitator explained—. Anyway, there is no doubt that we need to put the main focus on "3rd axis...". And with a combination of these 2 cards, we need to find something.

It is very hard work —expressed the team members—, because we have almost 300 cards. And we need to find the titling of 150 small islands. Anyway, it is very interesting. Probable we can find different solutions than an affinity diagram.

Yes —the facilitator pointed out—, it is. You can find a completely different picture than an affinity diagram. Everyone —he called their attention—, difficulties, troublesome is just this first building up which is the consideration of small islands. And this process is the most important game. And building up middle-sized islands and large islands is the same process as the affinity diagram...

—Well, let us enjoy the coming up with the titling of small islands.

Then, a very quiet debate was made.

Digressing from the story and talking about a **Quiet debate?** ...In the



TQM-4 Thinking
environment, by Sensei
Kimura

world, there is a tendency for "heated debate to be better". But I cannot agree with this tendency because of the next 4 reasons. Firstly, the speaker claims his or her opinion's rightfulness, which is quite natural. And secondly, naturally, he or she tries to defeat other opinions, which is also quite natural. Then, the room for listening to other opinions becomes smaller (A human universally has "Confirmation bias".) And lastly, a person has a nature of "Peer (conformity) pressure". Consequentially, the opinions become biased.



Confirmation bias (from TQM-4²)

Confirmation bias is a cognitive bias that only collects information that is convenient for you or that supports your beliefs and hypotheses and does not try to collect information that goes against your opinion.

And then, it has the characteristics below.

- You become less likely to notice errors in your own thoughts and hypotheses.
- I think my ideas and hypotheses are too true.
- It is difficult to notice small failures, and it is easy to lead to big failures.
- Overestimate even the rarest probabilities.
- make you overconfident.
- Ignoring facts and evidence.

You tend to like people who share your opinion and dislike those who disagree with your opinion. The latest functions that use algorithms in SNS, etc., which are often seen in recent years, reduce the chances of seeing dissenting opinions on the site, making it easier to amplify confirmation bias.

It is necessary to understand that refutation is also for your own benefit.

"In this bias, the most familiar case is past success experience. This is a very strong enemy for thinking of problems countermeasures".

Shortly and simply:

Confirmation bias is a type of Cognitive bias that occurs when people favour information that confirms their pre-existing beliefs or biases, regardless of whether the information is true. And Confirmation bias is one example of how humans sometimes process information in an illogical, biased manner.

By Wikipedia



Peer (conformity) pressure

² TQM-4 Thinking Environment [eng]: <https://archive.org/details/tqm-4-thinking-environment>
TQM-4 El Entorno de Pensamiento [esp]: <https://archive.org/details/tqm-4-el-entorno-de-pensamiento>

Peer pressure is the implicit coercion of minority opinion in a group to think and act like most people around them. For example, there may be an atmosphere during a meeting where you cannot express an opinion that differs from the majority, or you may not be able to refuse to work overtime because many people are working overtime. Peer pressure occurs when people are expected to behave in the same way as the rest of the majority.

It is never an exaggerated expression that a heated debate can never create a sound conclusion or cannot create a breakthrough idea. Therefore, I suggest using the "quiet debate with card" method.

Please understand you are not AI, but humans who have emotions and many biases. On the other hand, these differences to AI are the human strength.

Nowadays, computer science has been developing at a speed that humans cannot keep up with. And it must be necessary to use it very safely for us. How can we overcome AI? ...I intentionally used the word "Overcome". Because AI has a very serious capacity as you know.

According to a book, there are 3 progress stages, which are Learning AI, Generative AI and Machining AI (tentative name). 1st stage Learning AI is artificial intelligence that can create algorithms that can make highly accurate judgments and inferences by learning past data through machine learning. And there are 3 types of machine learning: Supervised learning, Unsupervised learning, and Reinforcement learning. In addition, there are 2 methods of AI learning: Machine learning and Deep learning.

Currently, AI is 2nd stage which is Generative AI. And this is the Output stage of thinking against the 1st stage of Learning AI which is the Input.

AI is growing very rapidly and soon we will look at the 3rd stage which is the transformation of the 1st and the 2nd thinking (brain) to work & control a machine or robot. (It is the world of the movie "Terminator"... Scary.)

Once again, we need to overcome and use correctly AI. But how? ...The answer is "Human power".

Once again, we need to overcome and use correctly AI. If comparing humans and AI, human strengths include ethical judgment, thinking ability, and cognitive ability. On the other hand, AI can process huge amounts of data at high speed, so it can solve complex problems that are difficult for humans. Also, once AI learns, it does not repeat the same mistakes and can perform tasks with a high degree of accuracy.

On the other hand, human has weak points which are Emotion and Bias. To overcome AI, we need to overcome these 2 kinds. One is Emotional Intelligence. And, Emotional Intelligence is required for humans to demonstrate their strengths. Emotional intelligence refers to the ability to perceive, control and evaluate emotions. People with high emotional intelligence are able to connect with others, build empathic connections, communicate effectively, overcome conflicts, and express their emotions. Also known as Emotional Intelligence Quotient (EQ).

To overcome, it is necessary the Creativity. And Human Power and Creativity are not the same, but Human power is the base of Creativity. However, unfortunately, a human cannot escape from the above weak points, even if it is remarkable or not by individual.



Collaborative Thinking & Cognitive Bias

I wrote about Cognitive bias before. And we cannot avoid it, because we are human. And we should recognize and accept it with calm understanding.

Acceptance of Bias? ...Not only the Bias but also (for example) Peer pressure, we need to recognize and accept these. And based on the acceptance in calm understanding, we should act.

But how? ...For instance, discussion. How can we have a discussion to decide something? ...My suggestion is to use card writing.

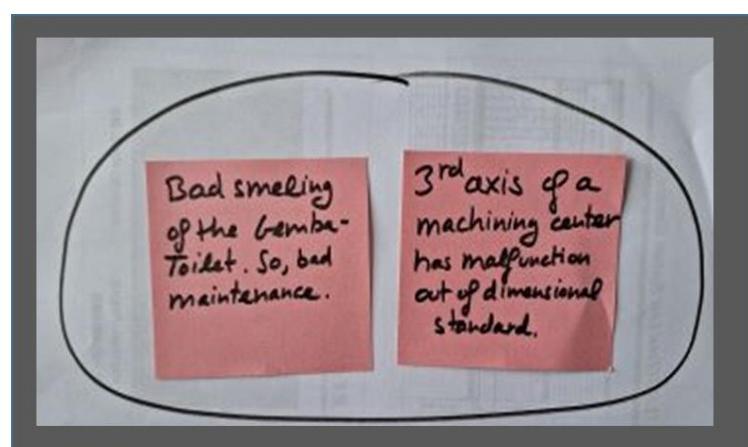
Why are cards written for debate and discussion? ...One of the recent remarkable inventions is the Internet and SNS. And anybody can write and send their opinion easily. Yes, anybody can send their opinion anonymously. Perhaps, what makes it easy is the anonymity.

The card writing (in KJ activity) is not completely anonymous, but is easier to express opinion than speaking. Therefore, I'm recommending writing cards in KJ. And, when doing the writing cards in KJ, there are rules. One of the rules is to write in "spoken language, shortly and easily".

Now, going back to the theme of **Creative Thinking KJ**.

The most difficult process is to make small islands with base cards & random cards.

It is easy to choose the "affinity" card to a base card. But it is very difficult to come up with the creative thinking in 2 cards which are without any context. And this Creative Thinking KJ is the most difficult KJ. Of course, it promises the creative thinking process and the results.



Now, 2 cards in the right picture, in which the group is required to create the title. Then they did the short Braincalming as next: Not Brainstorming, but **Braincalming**.

By the way, I had a conversation with the operators. Their complaint or concern is the accident frequency. The accident frequency!? Increasing or decreasing or chronic?

The answer of the operators was: —We don't know, but might be an increasing or chronic condition.

—Is there a standard for investigating safety? —The Facilitator asked them.

—Yes, there is —one operator answered.

And the Facilitator asked then: —How about the recent records of examination?

—2 phenomena. Once time there was a phenomenon of decreasing accidents. The timing was the special safety examination done. But it was turned to increase after the special event. Thus, the toilet also has a standard of regular clean-up. But recently bad odour raises. Maybe the rule is not kept correctly.

—Everyone —the facilitator called their attention—, please write your opinion in a card.

Then, group members wrote each opinion of the title. And disclosed on the table and discussed. The facilitator declared as next. —The title of this island is "to check 4Rs of machine and safety". OK? —asked the facilitator.



4Rs is One of the Toyota teachings and, the cycle of **Make rule, Teach rule, Keep (and follow) rule and Change (if necessary) rule**. Then, the island was titled as the picture attached. It is indeed troublesome. But it is also a matter of getting used to it.

Again, we need to overcome AI. But we have (more or less) weak points, because of humans. AI cannot do such conceptualization. The process after this (small island making) is the same as the Affinity diagram. However, I prefer to omit such a process now.

By the way, and about **Brainstorming**



[Brainstorming Wikipedia](#)

In reality, I'm very much negative about the Brainstorming method for finding a little complicated solution. And sometimes I say that Brainstorming has no effect on deriving solutions or rather than it is bad.

I never say that don't do it, and I'm telling you that use it to understand the weak points. And, I think you may understand why I was writing about Cognitive bias, Facilitator and KJ. Thus, I deny a leadership in a debate but suggest bringing up a facilitator. Well, let's look at Brainstorming.

However, what is **Brainstorming**³?

Brainstorming is a group creativity technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously contributed by its members.

In other words, brainstorming is a situation where a group of people meet to generate new ideas and solutions around a specific domain of interest by removing inhibitions. People are able to think more freely, and they suggest as many spontaneous new ideas as possible. All the ideas are noted down without criticism and after the brainstorming session, the ideas are evaluated.

...

One of Osborn's key recommendations was for all the members of the brainstorming group to be provided with a clear statement of the problem to be addressed prior to the actual brainstorming session. He also explained that the guiding principle is that the problem should be simple and narrowed down to a single target. Here, brainstorming is not believed to be effective in complex problems because of a change in opinion over the desirability of restructuring such problems. While the process can address the problems in such a situation, tackling all of them may not be feasible.

...

Two principles:

Osborn said that two principles contribute to "ideative efficacy": Defer judgment and, Reach for quantity.

Four rules:

Following these two principles were his four general rules of brainstorming, established with the intention to: of reducing social inhibitions among group members; stimulating idea generation; and increasing the overall creativity of the group.

These four rules were:



...

By Wikipedia

Alex F. Osborn Wikipedia

Probably, Alex. F. Osborne⁴ knew the limit of this method. "People are able to think more freely and they suggest as many spontaneous new ideas as possible."

³ Brainstorming, <https://en.wikipedia.org/w/index.php?title=Brainstorming&oldid=1144071846> (last visited Aug. 7, 2023).

This is ideal. But actually, people cannot be free or cannot make free talking, because of their own cognitive biases, and social inhibitions among group members.

If this Wikipedia's description is faithful to the thought of Osborn, he also thought as above.

By the way and about "Social inhibition"... I wanted to confirm this and asked to a Chat AI.

—What is Social inhibition? Write in bullet points. —I asked Chat-AI, and the answer is next:

Social inhibition is the tendency to suppress one's behaviour, emotions, or thoughts in order to conform to social norms. It can also describe those who suppress anger, restrict social behaviour, withdraw in the face of novelty, and have a long latency to interact with strangers¹. Here are some examples of social inhibitions:

- Not speaking up when you disagree with someone
- Not asking for help when you need it
- Not expressing your true feelings
- Not trying new things because you're afraid of what others might think

Modern Brain Science has clarified this difficulty (Doing true Brainstorming). I claim that you cannot do this. No, it is not, and you can. But you can never get a sufficient solution. And you are satisfied in an insufficient solution.

A little more, let's look at Brainstorming...

Any Affinity diagram explanations are recommended to use Brainstorming for creating ideas. But I will say it is not a good method for creating ideas. Once again, it is not good for you. But, why? ...Because it requires very special conditions.

Special conditions!? ...What are these? ...Let's think against. What is necessary or a better condition for brainstorming? ...I'm telling you that probably you cannot implement correct Brainstorming.

You may say as next: —Correct Brainstorming? ...we are using it frequently. Are you saying our Brainstorming activity is wrong has no meaning or is not effective? ...And you may say am I saying joke?

—No not at all, and I'm very serious —I could answer—. I say that your Brainstorming use is the wrong way to the true method and for it, you cannot reach to good effect, even if there is a meaning.

A little long, but I explain the Brainstorming method.

⁴ **Alex Faickney Osborn**,
https://en.wikipedia.org/w/index.php?title=Alex_Faickney_Osborn&oldid=1144119334 (last visited Aug. 7, 2023).

III. Brainstorming

1) What is Brainstorming.

I would omit the detailed explanation. But instead of it, I introduce the **Wai-Gaya** of Honda.

Wai-Gaya and Brainstorming are different methods. But there is a common process. In general, brainstorming and **Wai-Gaya** are aimed at lively discussions in free talking, but **Wai-Gaya** at Honda refers to training camps held outside the company or separated spaces inside the company for three days and three nights.

There is a simple, and a daily base, **Wai-Gaya** also. Thus, Honda's "**Wai-Gaya**" can be said to be how each member understands the value of their daily experiences, and whether they are able to conduct on-site observations in advance to see the essence.

If Honda's **Wai-Gaya** is also one type of advanced Brainstorming, I can say that I have seen good examples of Brainstorming in both process and the effect. Is it possible to implement it by your company? ...Sorry, I don't think so. Because to implement it, it is necessary the corporate culture. In Honda, there is such a corporate free-talking culture nurtured.

2) Type of Brainstorming.

I was surprised when I checked it to confirm my knowledge, I could find there are so many types of it. I knew that there are some kinds like the use of KJ. But my prediction was broken and there are many, many kinds.

The next paragraphs are the copy from SNS. If you like, please ignore these...

*There are many brainstorming methods that can be used to generate ideas. Some of the most popular brainstorming methods include **mind mapping**, **Reverse Brainstorming**, **Starbursting**, **SWOT Analysis**, **Round Robin Brainstorming**, **Crawford Slip Writing Technique**, **Brainwriting 6-3-5**, and **Brain Netting**.*



Mind-Mapping

Mind mapping is a visual thinking tool that helps you organize information and ideas. It is a method of brainstorming that involves creating a diagram to visually represent ideas and concepts. The diagram is created around a central idea or theme, with related ideas branching out from it. Mind maps are often used for note-taking, brainstorming, problem-solving, and decision-making.





The **Mind-Mapping**⁵ method was developed by Tony Buzan in the 1960s. Buzan was a British author and educational consultant who developed the technique as a way to help people improve their memory and creativity. Mind mapping has since become a popular tool for students, professionals, and anyone looking to organize their thoughts and ideas.



Reverse brainstorming

Reverse brainstorming is a technique used to generate ideas by considering the opposite of the problem. It is also known as negative brainstorming or reverse thinking. In this technique, instead of asking "How can we solve this problem?" you ask "How can we create this problem?"

For example, if the problem is "How can we increase sales?" you would ask "How can we decrease sales?"

This technique is useful when you are stuck in a creative rut and need to approach the problem from a different angle. It can help you identify potential obstacles and find ways to overcome them.



Starbursting

Starbursting is a brainstorming technique that focuses on generating questions rather than answers. It is used to explore the potential of an idea by asking questions about it from different perspectives. The method is called "starbursting" because the questions radiate out from the central idea like the rays of a star.

The **Starbursting** method is particularly useful when you have an idea that you want to explore further or when you are trying to identify potential problems with an idea. It can also be used to generate ideas for new products or services.

To use the **Starbursting** method, start by writing down your central idea in the center of a piece of paper. Then, draw lines radiating out from the central idea like the rays of a star. At the end of each line, write a question about the central idea. The questions should be open-ended and begin with words like "what," "why," "how," and "who."

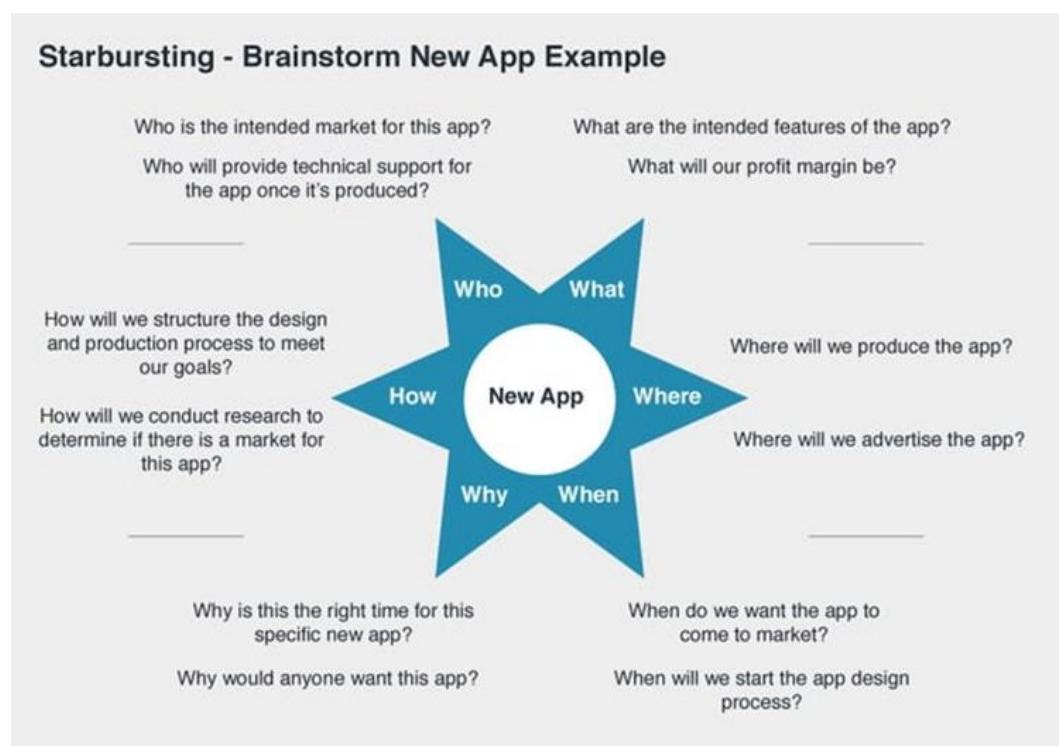
⁵ Mind map, https://en.wikipedia.org/w/index.php?title=Mind_map&oldid=1161474158 (last visited Aug. 7, 2023).

Mapa mental, https://es.wikipedia.org/w/index.php?title=Mapa_mental&oldid=153092869 (consultado por última vez agosto 15, 2023).

For example, if your central idea is “a new type of bicycle,” some questions you might ask include:

- What materials should be used to make the bicycle?
- Why would someone want to buy this bicycle?
- How can we make this bicycle more comfortable?
- Who is our target market for this bicycle?

By asking these types of questions, you can explore different aspects of your central idea and identify potential problems or opportunities.



SWOT Analysis

SWOT analysis is a strategic planning technique used to help a person or organization identify strengths, weaknesses, opportunities, and threats related to business competition or project planning. It is a simple but powerful tool that can help you focus on your strengths and weaknesses while identifying opportunities and threats that you may not have considered.

The **SWOT analysis** brainstorming method is a way of using the SWOT analysis technique to generate ideas for new products or services. It involves brainstorming sessions where participants are encouraged to think creatively about how they can use their strengths to take advantage of opportunities and overcome weaknesses and threats.

The **SWOT analysis** brainstorming method can be used in a variety of settings, including business planning, marketing research, product development, and project management.

It can be used by individuals or teams and is often used in conjunction with other brainstorming techniques.

*SWOT stands for **Strengths, Weaknesses, Opportunities, and Threats**. It is a strategic planning tool used to identify and analyze the internal and external factors that can affect an organization or a project. The SWOT analysis helps organizations to identify their strengths and weaknesses, as well as the opportunities and threats that they face in their environment. This analysis can be used to develop strategies that leverage strengths and opportunities while minimizing weaknesses and threats.*



Round Robin Brainstorming

Round Robin Brainstorming is a technique used in brainstorming sessions where each participant is given an opportunity to share their ideas in turn. The participants sit in a circle and take turns sharing their ideas. The first person shares their idea, then the person next to them shares their idea, and so on until everyone has had a chance to share their ideas. This technique is useful for ensuring that everyone has an equal opportunity to share their ideas and that no one person dominates the conversation. It also encourages participants to build on each other's ideas and can lead to more creative solutions.



Crawford Slip Writing Technique

Crawford Slip Writing Technique is a type of brainstorming technique that promotes creativity in teams that need to manage ideas in order to make important decisions on a specific topic. The technique involves giving each participant a set of paper slips and asking them to write down as many ideas and suggestions as they can on separate slips of paper. The participants are encouraged to keep contributing until ideas run dry, ideally getting between 5 and 25 ideas from each. This technique gives the opinions of all team members equal weight, however quiet they are.



Random word brainstorming

One of the purposes of brainstorming is to discover new ideas. Regardless of whether the idea is good or bad, you can reach the best idea and the best solution by actively generating ideas for a certain topic or issue. The “random word brainstorming” method is a framework for promoting such brainstorming. In Random Word Brainstorming, simply share the first idea or word that comes to your mind. By recording those ideas and words and grouping them after the session, you can discover creative solutions. This brainstorming method is fast-paced and can be a very efficient way to solve a defined problem.



5-Whys Brainstorming

Like the Reverse brainstorming method, the 5why analysis is used to identify the cause of the problem and prevent the same problem from reoccurring. By asking the question "Why?" to a certain problem over and over again until there is no answer, you will be able to minimize the risk of the same problem occurring. A why-why analysis typically uses five "why?" questions, but there is no upper limit to the number of questions.



SCAMPER⁶ method

The **SCAMPER method** is a brainstorming method developed by creativity development researcher Bob Eberle by modifying "Oz Born's Checklist" and was originally used as a game to improve the imagination of young people. I was. However, it is now the framework adopted by many companies because of his ability to find innovative solutions to complex problems. This framework defines the problem through seven questions: 1. **Substitute**: Are there alternatives? 2. **Combine**: Can it be combined? 3. **Adopt**: Can it be applied? 4. **Modify/Magnify**: Is there anything that can be improved/adjusted/expanded? 5. **Put to other uses**: Are there other uses? 6. **Eliminate**: Is there anything to remove? 7.

Reverse/Rearrange: Is there anything that can be replaced or rearranged? Through the above questions, he will be able to tackle problems from multiple angles by implementing the SCAMPER method and become like him who can discover solutions and service ideas that have been overlooked until now.



[SCAMPER Wikipedia](#)



Rapid ideation

"Rapid ideation" is similar to "random word brainstorming," but uses handwritten brainstorming instead of verbal brainstorming. This will allow us to collect many ideas from people who are not used to speaking.

Others: Gap filling, Brainwriting, Rolestorming, Stop-and-go-brainstorming etc. And all of them from above are the copy paste from SNS... Wow, there are too many! But there are meanings, if you use (or can use) them.

What do I recommend you to use? ...I have no interest in which you choose. Because perhaps you cannot do it even if you choose any type of Brainstorming. Above methods are good. However, the fundamental method is not shown. Fundamental method? ...It is how to let them create ideas, speak up about free ideas and gather free ideas. If there is no such condition, there is no meaning even though the styles of building up ideas are good.

Why I'm so negative about Brainstorming? ...I'd like to introduce a story.

⁶ SCAMPER, <https://en.wikipedia.org/w/index.php?title=SCAMPER&oldid=1148801546> (last visited Aug. 7, 2023).

3) Seriously a Brainstorm?

I visited a company. When passing a meeting room, we heard a person's voice. I thought he was making something of a lecture. And the director who led me on the factory tour and I entered quietly the meeting room to see their meeting. The attendees almost 10 persons turned to look at us. Then the lecturer continued his speech.

I whispered and asked what they were doing. He whispered they are doing Brainstorming for the theme of XXX.

—Hmm, I see. —And we came back to the reception room. He said that his company quite often makes Brainstorming for any case such as problem solving, creation of advanced ideas etc.

In my heart, I felt something disturbing, but I did not express my feelings. Then I answered: —I see but it is a good thing.

Then we began the main theme which was the consulting contract. Thus, this company is required to resolve the quality concern (to cut a long story short, improvement by TQM).

Malcolm-san was the manager of the manager, who asked me: —I asked his very frank his point of view on which quality improvement process you have the worry about.

The quality improvement processes are Problem recognition (including corporate constitution), Analysis of the current situation, Identifying the current problems, Prioritization then making an Action plan. Then improvement action is constructed of Analysis of the current situation, Fishbone diagram (or others), Root cause solving by taking action, confirmation of effect and result and standardization.

—Mr. Malcolm, Which process do you have your concern about? —This question is very spiteful for him. Probably he also couldn't grasp the total picture of quality concern. And the group which consisted of **production engineers, and quality engineers** were holding the Brainstorming conference.

Mr. Malcom-san said he desired to establish the concrete quality improvement Tactics. It was very vague, and I asked him what the purpose of the Brainstorming meeting was. Then, I could listen to the purpose of that Brainstorming and it was to find a solution. And according to Mr. Malcom, they had a similar meeting several times.

I really felt they could not. Of course, it is not possible to establish the Affinity diagram. Then I asked: —Mr. Malcom. Who is that **lecturer**?

He said: —No, he is not a lecturer, but the **chairperson**.

—Mr. Malcom If you say that is Brainstorming, they cannot possibly succeed and never gain creative or idea got to point.

—What??? —Mr. Malcom asked me surprisingly and he tried to deep into his question—. Mr. Kimura, I don't understand. Please let me know the reason. Why?

I prefer not to dive into this explanation but into the problem: —Thus, do you understand what was wrong? ...Here, I pointed out 3 wrong points in the short conversation: First is attendees,

which must be kept the diversity. In this example, the members consisted of production and quality engineers. Then, it is quite natural to tend to similar ideas. So, why not involve other department persons, for instance, accounting, and human resources? ...Probably you will say that these departments' persons cannot understand the production process. Even more, you will say they cannot understand the quality problems.

—Mr. Kimura —He questioned me then— I think it is no meaning to involve such administrative department staff in this Brainstorming. Basically, they cannot understand the process, even about the quality matter.

—Please consider carefully —I pointed out—, is it possible to say that the engineers are being in understanding? —And, I answered myself— If you say that they understand the all conditions of the production process and the all-quality problems well, why they cannot identify the solution immediately? One of the important things is that even for engineers, the degree of understanding is very limited. Because the process including the condition of equipment is alive. The same problems occurred. The defect is the same. However, are the facts (causes) the same?

I answered without waiting for any answer from him: — No, never. Machine conditions like a lubricant, wear, air pressure, temperature, operator, etc. There is no same condition. Because, even engineers, are humans who have a bias (tends) based on past success, and past knowledge. Therefore, the member needs to consist of various persons...

—You are easily say Doing Brainstorming. If I say you Brainstorming, it is only (pretend or fake) Play Brainstorming and your masturbation (sorry bad word). But, as in the case of this example, (not only a lack of diversity, but also) there is also the lack of preparation.

—You may say Brainstorming is easy and convenient —he answered just a little surprised.

—Don't say joke!? —and I detailed—. If you think so, it is ridiculous. Even Brainstorming, is necessary for a ceremony and preparation. The contents of the preparation are:

- 1) Choosing members by diversity.
- 2) Ceremony by relevant manager or top.

—The manager needs to explain his complaints and their importance with serious sometimes strong words. (Some book says that the boss shouldn't attend the meeting. It is correct. But the first ceremony must be attended by the boss.)



Sharing the data and information.

Confirming (deeply) the situation in Gemba (for the accounting and human resources etc.). Not once, but plural times to share basic understanding. However, of course, it is not possible to gain technical matters and pieces of knowledge for the staff of accountants and human resources. But it is very much acceptable. One of the keys to QC circle success is the member's diversity.

Therefore, the stage of preparation is important and takes a little long time.

Sharing information? ...Simple case. If the target is to resolve a defect by machine.
Sharing information is (like QC Circle): Total situation of quality (including customer

concerns), Quality cost, Pareto diagram, The reason for the target chosen, and The defect confirmation. Complex case. Total quality improvement tactics and action plan.

Same as above, and The sharing information is (like QC Circle): Total situation of quality (including customer concerns), Quality cost, Pareto diagram, Review of past action plan and result, Organization, Hard barrier (in-house and outside). All those are prepared as information sharing.

It is a very hard task, isn't it? ...And, by whom? ...Of course, quality engineers. And then, it is possible to understand the current situation and the needs of all. And it is the same to another case (other than the theme of quality).

The start of Brainstorming also is to gather and confirm facts (not truth but objective facts). And, I would like to add, that it is not necessary to gather all data, but as much as possible. And if there are the ideas of additional gathering facts in the meeting, at this point, gathering and adding information is very much important. Yes, it is acceptable incomplete gathering data. But at least the above items should be prepared as a minimum.

Does your Brainstorming prepare enough (as a minimum)?



Facilitator

Another key to Brainstorming success is the "Facilitator". The director of this company told me "Not lecturer, but chairperson". In this sentence, two problems are hidden.

Firstly, the Chairperson (toastmaster)? ...No, no, no. In Brainstorming, one of the important players is the "Facilitator" and not the Chairperson. There are differences between a Facilitator and a Chairperson. The point is whether it is necessary to elicit opinions. Thus, what are the conditions of a facilitator? ...And what are the different Facilitators and Chairpersons (who are similar, but there are different points)?

When I made this suggestion to Mr. M, he manifested his distrust. His image of the facilitator was almost the same of the chairperson. (By the way, he had no experience of using a facilitator.) Probably, my and his images of them were different. To ensure my images of them, I questioned to *AI Chatbot* in English. (Also, to ensure the images of European people.)

—What is the main duty of the chairperson? And, what is the main duty of the facilitator?

—Chairperson: The main duty of a chairperson is to preside over meetings and ensure that they are conducted in an orderly and efficient manner. The chairperson is responsible for setting the agenda, keeping the discussion on topic, and ensuring that all members have an opportunity to speak. They also have the power to make rulings on procedural matters and enforce the rules of the organization. In addition, the chairperson may be responsible for representing the organization in public and communicating with members and other stakeholders

—Facilitator: A facilitator is a person who helps a group of people understand their common objectives and assists them to plan how to achieve these objectives; in doing so, the facilitator remains “neutral” meaning he/she does not take a particular position in the discussion. The facilitator is responsible for guiding the group through the process of achieving its goals by encouraging participation, promoting mutual understanding and aiding in the generation of ideas. The facilitator is also responsible for ensuring that the group meets its objectives by managing the group process.

Right? Isn't that right? ...Once again, a facilitator has the role of eliciting participants' creating ideas. To enumerate as many as possible the abilities of them.

- 1) Goal setting and preparation
- 2) Can suppress self-assertion
- 3) Not influencer (relationship of power, knowledge)
- 4) Able to manage time
- 5) Be positive thinking
- 6) Ability to elicit opinions (Entertainability, listening ability)
- 7) Communication ability
- 8) Logical thinking skills (objective standpoint)
- 9) Put together
- 10) Organizing and narrowing down opinions
- 11) Consensus building among participants (Adjustment ability)
- 12) Trusting relationship with participants

Above 6 and 8 are different points of role or characteristic of the facilitator or chairperson. Here, what is the necessary skill of a facilitator? How to induce and let participants come up with ideas. I introduce the next 2 capacities which are involved in the above 6.

1. He/ she needs to differentiate straight ball and a curve (breaking ball).

For example, you want to think about how to reduce overtime work: Instead of just asking the question how to reduce overtime work (straight ball), you ask questions such as, "What do you feel is inconvenient in performing your work?", "What do you feel is a waste of time?", and "What are you doing to reduce waste time?"

For example, the theme is to reduce machine work defect: Instead of (or not only to ask) the ask of "how to reduce recent machine work defect?" you ask "How about the condition of the machine in the data of machine performance?", "Do you know the situation of operator training?", "How about the storage method of materials?".

It is necessary to make straight ball questions, but also to throw such surrounding relevant conditions. As you understand, a facilitator needs to have such quick-witted thinking capacity

2. Quick-witted (induce Serendipity)

Other quick-witted capacities are as next: Vain chatter, tea break, stretching or short walking, change meeting room, imitation of Yoga, ETC. Anyway leaving the atmosphere of the meeting. Is the job role of facilitator, easy?

—Once again “not lecturer, but chairperson”. When looking at that Brainstorming, I thought he was a lecturer, because so long he explained his opinion or his assertion. Additionally, I guessed he might be an influencer —I said to Mr. Malcom and I continued —. I cannot understand what that meeting is. Moreover, that meeting like has no correct form as a meeting. —Please teach them what a true meeting is (argumentative?).

I think that people have different opinions, but I think there are only 3 main types of purposes for holding meetings, which are "sharing information, deciding something and collecting ideas".

Of course, in reality, there are various types of meetings and the purpose of holding meetings, depending on the agenda, the theme to be held, the number of people, whether it is a regular meeting, etc., and I am fully aware that each meeting has its own name. However, if you boil it down, you should finally arrive at one of the 3 mentioned above.

So, what kind of meeting is a meeting to share information & and decide something and a meeting held to collect ideas? ...In my previous company. There is a so-called meeting system. Next is the list of regular meetings and a total of 12 meetings in the SWS (Sumitomo Wiring System⁷) Meeting System as an example:

No.	Meeting name	Frequency	Date	Division Manager	Quality Manager	Finance Manager	Engineering Manager	Purchasing Manager	Maintenance Manager	HR Manager	Production Control Manager	Production Manager	Discussion Content
1	Management Meeting	once a month	The 10 th of each month	X	0	0	0	0	0	0	0	0	
2	Quality Meeting	once a month	The 5 th of each month	0	X	T	0	0	0	0	T	0	
3	Production Control	once a month	The 25 th of each month	0	0	T	0	0	T	T	X	0	
4	Kaizen Committee	once a month	Depends	0	0	0	0	T	T	T	T	0	
5	Safety Committee	once a month	Depends	0	0	0	0	0	0	0	0	0	
6	New Product Committee	once a month	Depends	0	X	0	0	0	0	0	0	0	
7	Environment Committee	once a month	Depends	0	T	T	0	T	T	T	T	0	
8	QCC Presentation Committee	Once a quarter	Management Meeting, 10 th of the month	0	X	0	0	T	T	T	T	0	
9	Weekly Meeting	Once a week	Mondays	X	0	0	0	0	0	0	0	0	
10	Claiming Meeting		Depends	0	X	T	0	T	T	T	0	0	
11	Accident Meeting		Depends	0	0	0	0	0	0	0	0	0	
12	Project Meeting		Management Meeting, 10 th of the month	0	0	0	0	0	0	0	0	0	

In the list, there are such **Quality Claim** (by customer) **Meetings** and **Accident Meetings**. Of course, these are never regular meetings, but immediate meeting when they occur. All these regular meetings are not for the creation of ideas, but for Sharing information, Confirming as total and Deciding. And the important thing is the preparation. If discussing the ideas in such regular meetings, the relevant persons are fired soon (Of course, to be fired is exaggerated).

⁷ SWS Meeting System meanings: X – President / Organizer. O – Participant / Informed. T – Depending on the theme.

Last page image is the meeting system of my previous company. It is not all, but almost regular meetings. Besides the above, there are shift meetings, group meetings etc. For instance, there are 3 important regular monthly meetings which are **Management Meeting, Quality Meeting** and **Production Meeting**. These three regular meetings are not for creating ideas, but for **sharing, confirming information** and **discussing & deciding**. The essential activity of these meetings is the advanced preparation.

On the other hand, Brainstorming aims to create ideas.

I wrote that you cannot implement Brainstorming. And the barriers are meeting members' diversity, and the skill or capacity of the facilitator. But, just a little more I'll write the other barrier.

4) Brainstorming Rules

When doing Brainstorming, there are rules next:



Rule (or the points) of Brainstorming implementation:

- The first requirement is that "all participating members understand brainstorming";
- Even crazy ideas are OK;
- Quantity over quality;
- Induce ideas by combining ideas;
- Collect ideas in having fun and freely come up with ideas.

And the rules are:

- 1) Choose a facilitator;
- 2) Set goals and objectives;
- 3) Complete on time;
- 4) Decide which brainstorming method to use;
- 5) Confirm ground rules;
- 6) Record every idea;
- 7) Vote and discuss ideas;
- 8) Turn ideas into actions.

Are these barriers or difficulties? ...No, these are not. But the biggest barrier or difficulty is "Bias".

When actually looking at some brainstorming meetings, there were 2 tendencies as next.

- 1) Remarked by limited persons.
- 2) Opinion biased. We need to recognize "Not all persons like to talk". Some people find it difficult to express themselves in public. Including such persons is diversity. Also, sometimes people don't voice their opinion because it can create "social pressure".

You have to listen when someone is speaking. When you are listening to someone, your thoughts stop. And it is natural for a bias to come. So, at this time, people fall into "bias"

inevitably. And also, for instance, the bias that "newbies and non-experts don't come up with good solutions" leads older members and engineers, for example, to underestimate the ideas of newcomers.

Sometimes people in a group are so focused on putting forward their ideas that they neglect to listen to others. However, such a phenomenon is the better thing at the beginning stage, because of less bias.

Can you involve persons who are not good at expressing their thoughts? ...Have you self-confidence not to be influenced (biased) by anybody, even though they are above the rules? Even though, If you say, yes, you don't have a human brain or are an ultimate narcissist.

Again, Collect ideas in having fun and freely come up with ideas: It is ideal and I never deny it. But can your group do this? And as a result, have you created a good idea?

Moreover, Vote and discuss ideas: The word is a good sound. However, I don't like this process and never recommend it. The meaning of such a sentence is as next. (By a SNS)

It can be used as a technique to select the best idea among the generated ones. After generating a list of ideas, participants can vote for their favourite ones and then discuss them in more detail. This technique can help to prioritize the most promising ideas and ensure that everyone has a chance to contribute.

Is it the meaning of sieving ideas, isn't it? ...I strongly disagree with this step. The ideas expressed must be respected and used. Yes, any ideas In KJ, there is the case of "Lone Wolf" and one Card Island. Such cards also must never be neglected. Brainstorming also has the rule of "Even crazy ideas are OK".

Doesn't this statement contradict the above rule about voting and discussing ideas, does this?

Creasy ideas? Whose judgement these are? ...I have spoken before about an association game. And the theme was "rain". One person wrote "apple" on a card. One of the other people wrote "universe": Rain, apple, universe. There were reasons for them to have ideas.

Therefore, human is interesting. And having, and creating such ideas is the human strength which AI can never have.

—Vote and discuss ideas! ...your rule is ridiculous —I affirmed—. Please listen —I begged—, human is not strong and has weak points which are such as Bias and peer pressure. If you want to win and use AI sufficiently, you need to overcome such weak points. How? ...The answer is **Diversity** and **KJ**, and not Brainstorming.

5) Better Brainstorming

If you like to use the Brainstorming method still, I would suggest the next process.

I would suggest for your better Brainstorming. This method can resolve the difficulties of Brainstorming (facilitator, overcome bias and participation by anybody). Thus, please use cards

(blank cards; labels to write ideas). Anonymity creates free thinking and ideas, anonymity creates the participation of all, even the persons who don't want to speak in front of others.

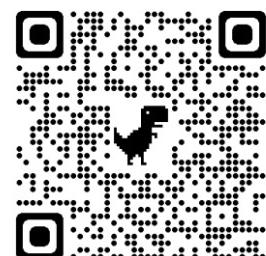
Anonymity card writing (I call *Label Okoshi*) has no time barrier (homework OK). Thus, anonymity is also effective in order not to underestimate or overestimate some ideas. Various people can come up with ideas without barriers. And, anyway card (*label Okoshi*) can overcome the problem of bias with participants' diversity. The most important step of Brainstorming is the step of "Creating ideas as much as possible". So please, use cards.

But, what!? ...So, using cards and "Label Okoshi"? ...Yes, indeed, it is the step of KJ.

Sorry, I commented a very negative opinion about Brainstorming. However, such a negative opinion is not just me, but there are some other opinions. For instance, Professor Robert Sutton⁸ (Stanford UV.) says the following, according to Wikipedia:

"Brainstorming is done every time something happens, and in the end, innovative ideas are not born and burnout."

Robert I. Sutton is a Professor of Management Science at the Stanford School of Engineering and a researcher in the field of evidence-based management.¹ He has been on the faculty at Stanford University since 1983.



Robert I. Sutton – Wikipedia
[eng]

I would finish the KJ method explanation. But from time to time, I will pick up the above subject.

6) Diversity

I'm writing Factory Management. And always I'm suggesting the importance of Diversity. So, Diversity in factory management.

I omitted the detailed description on this occasion and will deeper description in the next issue. But shortly:

1. Diversity is essential for Creative Thinking by group activity.
2. Diversity requests 2 dimensions.
 - a. One dimension which I call horizontal thinking is a diverse composition by diverse departments (in other words, diverse knowledge).
 - b. Another dimension is vertical thinking diversity.

I believe you already understand the diverse composition of diverse departments. However, you need to understand another consideration if you establish a group and wish good results. It is vertical diversity thinking. I will give you the conclusion: **You need to choose the same level**

⁸ Robert I. Sutton, https://en.wikipedia.org/w/index.php?title=Robert_I._Sutton&oldid=1158314936 (last visited Aug. 31, 2023).

(performance) capability of persons when you establish a group activity. It is not necessary to consider the persons' level but select (almost, about) the same (performance) level people. Even if you make a mistake, you shouldn't mix the person who is the presence of a leader and/or higher social level (than other members).

One of the means to win AI is team (group) power.

(Description In the following issue)

IV. Cost Control-7⁹: P/L Statement

It is related to the Teaching Company we are explaining in the previous lectures and just in this cone, but again I would take up the understanding of the P/L Statement. Because there are many questions from my friends.

Also, there are several questions about why I'm writing Cost in TQM. Simply I would respond to this question. The answer is: "Please don't forget Cost, even if your position is to be Quality engineers, TPM engineers."

Actually, just a monthly) P/L Statement is not sufficient or possible to manage a factory. Therefore, I'm teaching the method of Inventory Control by the KPI of Inventory Turnover. And, as mentioned above, not all amounts of procured materials and parts are Cost of sales. So, simply purchasing materials does not make the amount of the purchase an expense. The cost of purchased materials becomes an expense (Cost of sales) only when the materials are sold.

The income statement shows only the cost of sales and profit. Then, what happens to the portion that has not yet been sold, or the portion that had not been sold? ...The amount of materials and parts those have not been sold and are simply stored in the warehouse is not considered an expense. What happens is that these are called "inventory assets. The Teaching Company's (red tag) obsolescence products, (yellow tag) excess materials and even though normal inventory all are inventory assets.

The questions of friends are the next 3 points:

1. First; "Cost of sales to be only when the materials are sold."
2. Second; the relation between actual direct labour and material) cost.
3. Third; Why Inventory Turnover is important.

Let's look at these in the pitfall of the P/L Statement. Thus, again and again, it is about the P/L Statement. In this way, this Teaching Company also uses P/L Statement which is similar to my previous company. Then to explain these questions, I use my P/L Statement.

⁹ **Cost reduction/control** is a series of lectures about the interpretation of different cost regarding to calculate the Profit and Loss statement adequately depending on the activity and policy of the company:

- Cost Reduction – 6: [eng] <https://archive.org/details/tqm-3-hardware-software-diagnose-cost-reduction-6>
Cost Reduction – 5: [eng] <https://archive.org/details/tqm-2-introduction-2-cost-reduction-5>
Cost Reduction – 4: [eng] [https://archive.org/details/tpm-16-oil-control-5/page/8\(mode/2up](https://archive.org/details/tpm-16-oil-control-5/page/8(mode/2up)
Cost Reduction – 3: [eng] <https://archive.org/details/tpm-15-cost-reduction-3-and-consultancy-job-continuation>
Cost Reduction – 2: [eng] <https://archive.org/details/tpm-14-clasification-of-cost-and-oiling>
Cost Reduction – 1: [eng] <https://archive.org/details/tpm-13-oil-control-3/mode/2up>

P/L Statement			
Classification	Subjects	Remarks	Note
Planned	1 Sales amount & Sales KMH(Kilo Standard Hours) 2 Planned Labour Cost 3 Planned Material Cost		Actual amount & sales products x Standard H/P Σ Product Sold x SH x Standard Unit Labour Cost Σ Material Used in Sold x Planned Material (Standard) Cost
Direct Cost Modification	4 Planned Marginal Profit 5 Actual Labour cost 6 Planned Labour Cost 7 Labour Cost Modification (Labour Efficiency, Planned & Actual%, Repair Cost Quality Defect Ratio, Actual & Plan of Production KMH) 8 Actual Material Cost 9 Planned Material Cost 10 Loss on disposal of waste (Loss rate, Planned & Actual %)	4=1-(2+3) 7=5-2	Marginal Profit=Sales amount-Variable cost Actual working hours x Planned unit cost ÷ Achieved Efficiency Same to 2.
	11 Material Cost Modification 12 Direct Cost Modification Total (Outsourcing, Planned & Actual KMH)	11=8-3 12=7+11	Actual result of material cost. Same to 3. the part of material cost. Actual material scrap loss.
	13 Outsourcing Cost (Outsourcing, Planned & Actual KMH)		Treated as Direct Cost and Variable Cost
	14 Actual Marginal Profit	14=4-12-13	
Actual	15 Direct Expenses 16 Factory (Manufacturing) Overhead 17 Gross Profit 18 Selling Expenses 19 General and administrative expense	17=14-(15+16)	Other than Outsourcing (Metal mold, Tools, etc.) Indirect Material, Indirect Labour and other Indirect Expenses (Machine & Equipment Depreciation) Sales commission, sales promotion cost (advertising cost) Personnel costs (salaries, bonuses, various allowances) for indirect departments, costs for operating the office of indirect departments etc.)
Other Cost	20 Operating Profit 21 Non-Operating Income 22 Non-Operating expense 23 Ordinary Profit 24 Extraordinary Income or Loss 25 Tax 26 Net Profit	20=17-(18+19) 23=20+21-22 26=23-24-25	



Direct cost accounting and Standard cost accounting

I already explained these somewhere. But once again for your reference.

1. Direct cost accounting (Direct costing)

Direct cost accounting is one of the cost accounting methods that classify product manufacturing costs into fixed and variable costs, calculate costs by focusing on variable costs, and treat fixed costs that cannot be controlled by management in profit planning as periodic costs.

Needless to say, a company aims to pursue profit. Therefore, management must continually improve the production costs of manufacturing products. In doing so, direct cost accounting is used as a P/L calculation to incorporate analysis of cost, sales volume, and profit relationships into accounting records and to provide useful data for short-term profit planning.

2. Standard cost accounting (Standard costing)

Standard costing is a very effective method for cost control and cost reduction. This method first calculates the "Standard Cost," which is the target value, before the actual cost is incurred.

Next, the "actual cost" actually incurred is calculated, compared with the standard cost, and analyzed. By comparing and analyzing the actual cost, waste and loss can be eliminated and productivity can be improved. Cost reduction can be achieved.

In standard costing, it is important to set reasonable goals and standard costs that can be achieved. This is quite difficult.

There are two ways for a manufacturing company to increase profit: increase sales or reduce cost. Cost control to eliminate waste and increase profits is very important for the management of a manufacturing business.

Actually, the P/L Statement of my style which I used in my previous company Sumitomo is mixed with both **Direct costing** and **Standard costing**. In a way, this P/L Statement style is a little unique but very useful for managing the manufacturing industry.

But there are 3 prerequisites:

1. Proper standard cost of direct cost (labour and material; variable cost). Databases of Standard Time and cost table of parts and materials. Database of Unit cost (by department).
2. Annual action plan. P/L Statement is not ornamental, but a report card.
3. Keeping the relation to the annual budget.

at r i part.

P/L Statement			
Classification	Subjects	Remarks	Note
	1 Sales amount & Sales KMH(Kilo Standard Hours)		Actual amount & sales products x Standard H/P
Planned	2 Planned Labour Cost		Σ Product Sold x SH x Standard Unit Labour Cost
Direct Cost	3 Planned Material Cost		Σ Material Used in Sold x Planned Material (Standard) Cost

$$\text{Planned Labour Cost} = \sum \text{Product Sold} \times \text{SH} \times \text{Standard Unit Labour Cost}$$

Planned Material Cost

$$= \sum \text{Material used in Sold} \times \text{Planned Material (Standard) Cost}$$

These show the word of Sold. Once again, only the parts have been Sold. So, 2, 3 are Costs of sales. And these costs of sales are variable manufacturing costs and do not involve fixed manufacturing.

The purpose of using direct costing is to clarify the responsibility of the factory. The next is a general form of P/L Statement. If comparing this and my style, probably it is much more understandable.

P/L
Sales Amount
Cost of Sales
Gross Margin
Selling Expenses
General and Administrative Expense
Operating Profit
Non-Operating Income
Non-Operating Expense
Ordinary Profit
Extraordinary income
Extraordinary loss
Tax
Net Profit

	4 Planned Marginal Profit	4=1-(2+3)	Marginal Profit=Sales amount-Variable cost
Direct Cost Modification	5 Actual Labour cost 6 Planned Labour Cost 7 Labour Cost Modification (Labour Efficiency, Planned & Actual%, Repair Cost Quality Defect Ratio, Actual & Plan of Production KMH)	7=5-2	Actual working hours x Planned unit cost ÷ Achieved Efficiency Same to 2.
	8 Actual Material Cost 9 Planned Material Cost 10 Loss on disposal of waste (Loss rate, Planned & Actual %)		Actual result of material cost. Same to 3. the part of material cost. Actual material scrap loss.
	11 Material Cost Modification 12 Direct Cost Modification Total	11=8-3 12=7+11	

The above part shows 2 things: And this part and above (1, 2, 3 parts and Planned Marginal Profit) have no relation. But No relation!? ...No, there is no relation between the parts of 1 to 4 and 5 to 12.

Basically, the products sold (1) and labour cost used, and material cost used (5 to 12) are different timing: Toyota or my previous division uses the **Kanban** system and has no stock. However, no, it is wrong. SWS (Sumitomo Wiring System) even Toyota has minimum stock by Kanban control. For instance, the best record of Inventory Turnover of my division was 24 turns (in a month).

$$\text{Monthly Inventory turnover} = \frac{\text{Monthly Sales Amount}}{\text{Actual inventory (monthly record)}}$$

The average capability was 20 turns per month. And, it means that the inventory is turned over 20 times in one month and that the parts and materials purchased and the products were used or sold in about 1.25 days (25 days ÷ 20).

The case of this Teaching Company is very bad. However, there are many companies at the same level. And these companies have the same disease which is the trouble of cash-flow.

Even though going back to the original talk: No relation.

My style P/L Statement is on the assumption of the high Inventory Turnover. And this assumption is to sell and get cash within the short term. And it is possible to compare between 1 to 4 and 5 to 12.

1) The importance of Inventory Control by Inventory Turnover.

The P/L Statement is a very useful paper for managing a factory. Because the annual budget and improvement action plan should be controlled in the P/L Statement. But just the P/L Statement is never sufficient.

Because (for instance) this Teaching Company had very heavy excess parts & materials and excess work-in-progress. And there is a long-time lag between parts & materials purchased and labour costs used for the production process against the products sold.

"Make-to-stock production" is a general production style. Then this Teaching Company had and had been increasing the excess finished goods which have not died, but too excess. And soon some excess finished goods and work-in-progress will become part of obsolescence.

The situation was the increase of Obsolescence finished products, excess finished products & work-in-progress and parts & materials purchased which were fixing cash in the warehouse. Excess labour and machine & equipment capacities were kept for future expectations. Poor Production planning which was still invaded by the pressure of the Production department which pursued to use of the surplus labor and machines.

Therefore, I was telling them to stop the stupid policy of "Prohibition of receiving the order in red" and pursue the improvement of "Marginal Profit". It was the best answer. Or if they don't take down the flag of this stupid policy, it is necessary to treat the excess production capacity including land, and construction. It is the meaning of business shrinkage. (Or choose the way of bankruptcy.)

Consequentially, it is necessary to analyze the Balance Sheet in parallel. But as a manufacturing industry, the best index is Inventory Turnover. Because this data is easier to compare the Gemba (warehouse, red tag and yellow tag). It is like a visual control. This Teaching Company's Inventory Turnover (of the previous financial term) was 2.3 turns.

Why becomes so bad? ...The main cause was the increase in yellow tags (excess finished goods, work-in-progress and parts & materials). I was surprised when we made the plant tour, because of the increased excess finished products and work-in-progress.

As I wrote above, the P/L Statement shows only the P/L situation with selling products which have the time lag of timing sold and produced. And the surplus products are stored in the warehouse. These products, work-in-products and materials are accounted for assets, even if these are recognized as dead stock by design change or aged deterioration.

Below are the general terms of the Balance Sheet. And the terms shown in red are the goods of a warehouse. As you understand, these show the categories and amount of money. However, these are not categorized as obsolescence or excess goods.

Therefore, I strongly suggest managers **feel these in Gemba**.

CONTENTS OF THE BALANCE SHEET		
Current assets		Current liabilities
1	Cash and cash equivalents	Notes payable
	Cash	Accounts payable
	Petty cash	Accounts payable - other
	Checking accounts	Accrued expenses
	Saving accounts	Advance received
	Deposits at notice	Short-term debt
	Time deposits within one year	Bonds payable within one year
	Notes receivable	Withholding payroll taxes
	Accounts receivable	Deferred revenue
	Marketable securities	Suspense receipts
	(*) Merchandise inventories	Suspense received and accrued consumption tax
	(*) Finished goods	Reserve for bonuses
	(*) Unreceived goods	Discounted notes payable
	Work-in-process & Parts, Materials	Endorsed notes payable
	(*) Supplies	Fixed liabilities
2	Other current assets	Long-term debt
	Short-term loans	Long-term notes payable equipment
	Suspense payments	(*) Shareholders' Equity
	Allowance for doubtful accounts	Capital stock
	Suspense paid consumption tax	Legal reserve
	Fixed assets	Capital reserve
1	Tangible fixed assets	Legally retained earnings
	Land	Other capital surpluses
	Buildings	Voluntary retained earnings
	Building and accessories	Voluntary reserve
	Structures	Retained earnings
	Machinery & equipment	Unappropriated retained earnings at the end of the period
	Vehicles & delivery equipment	
	Tools, furniture & fixtures	
	Accumulated depreciation	
	Construction in progress	
2	Intangible assets	
	Goodwill	
	Patent	
	Trademark rights	
	Leasehold rights	
	Software	
3	Investments	
	Investment securities	
	Investments in capital	
	Long-term loans	
	Security deposits	
	Long-term prepaid expenses	
	Deferred assets	
	Inaugural expense	
	Development expense	
	Stock issuance expense	

However and again, we may talk about the **Marginal Profit**

$$\text{Return on Capital} = \frac{(26) \text{ Net Profit}}{\text{Total Capital}} = \frac{(26) \text{ Net Profit}}{(1) \text{ Sales Amount} \times \frac{(1) \text{ Sales Amount}}{\text{Total Capital}}} \\ = \text{Sales Profit Rate} \times \text{Total Capital Turnover}$$

Therefore, there are two ways to increase your Net Profit. The first one is **increasing the Sales** and another one is **reducing the costs**.

However, companies with a deteriorating rate of return on total capital will (actually I saw) have little room to cut costs. Then, the only way to increase ordinary income is to increase sales. And, in order to increase sales, it is common to increase sales volume by discounting, etc., but in this case, Net profit may actually decrease.

Therefore, I recommend the management of marginal profit by Break Even Point Diagram. I know the Break Even Point Diagram is not all mighty. However, it is the easiest way to analyze it.

If you rely too much on discounts, you will not only be unprofitable but also lose future prospects, so you need to improve your marketing ability and make efforts to increase your sales power so that you do not have to sell at unreasonable discounts.

Some people may not know exactly what to do to reduce their total capital. Since it means "total capital = sum of capital", the point is to streamline assets. The first asset to be reduced is "idle assets (excess machines & equipment, land & constructions)".

Some Top management hesitate to dispose of idle real estate because they don't want to admit their investment failure, or because they think the price should rise someday. And, there are companies (such as Teaching Company) who are dreaming the Phantom prospects with the wrong policy. Especially if the idle assets are real estate, the return on total capital may improve significantly, so you should consider disposing of them.

And, what you need to do to "reduce total capital" is to identify and dispose of inefficient, non-profitable assets. And we must never forget to reduce inventories. The total capital turnover is the number of times the total capital is operated (number of uses) in one year, and it can be said that the greater the number, the more efficiently the total capital is used. Therefore, if it is difficult to increase the ratio of ordinary sales profit, you should consider improving the total Total Asset turnover ratio.

So, how do you improve your Total Asset turnover? ...In fact, the total asset turnover rate is improved by improving the turnover rate of each asset such as the fixed asset turnover rate and the trade receivable turnover rate.

For small and medium-sized enterprises, the deterioration of total capital turnover is often caused by the deterioration of "Trade Receivable Turnover" and "Inventory Turnover". If your company's numbers for these ratios are poor compared to historical data trends or other companies in the same industry, you may include bad debts and bad inventory. If there are such bad assets, disposing of them will improve the rate of ROC (Return on Capital). In here, let's look at the situation of the Teaching Company.

2) Teaching Company¹⁰

That was a surprise. When I was in my room at the hotel, the receptionist provided a telephone. The person on the telephone was the Managing Director of the Teaching Company. And he told me his wish to see me.

Surprise, it was indeed a big surprise.

After visiting and finishing a job at another country's company, I came back to this country for my next company visit. It was passed 5 months after the meeting with him and the phantom president in the airport.

Then, 4 days later, the Managing Director visited my hotel. The purpose of his visit is the re-contract of my teaching. In fact, the meeting timing was bad, because I already drunk some alcohol and was too generous. And I ordered additional whiskey for me and him, just because and actually, he also is a drinker. After some chattering, I asked about the situation of his company and his job. And he explained the factory situation feebly in some papers.

In my heart, I felt He looked like becoming to be honest by drinking. I thought it would be good and may possible to hear the true current situation. He was bearish. And the reason was that all my prospects were correct. The sales amount was gradually declining. The trend of turnover rate that recovered once was turned to rise. The project team activity continued but stagnated.

Anyway, the situation was gradually declining.

In that situation, the Managing Director told me: —Sensei. May I ask you about the re-contract of consulting? —In my heart, again, I could get the promotion called Sensei. But it is only in vain.

—By the way, how about the situation of the stupid policy about “Prohibition of receiving order in red”?

He glowered at me through his glasses and told me. —Of course, it was continued and will be continued. And my headquarters decided on the new policy. It is the increase of Sales Profit Rate. This is one part of the strategy of “Return on Assets improvement”.

¹⁰ **Teaching company** is a series of a real story about the implementation of TPM and TQM in a medium sized company by **Sensei** Kimura. They are deployed throughout TPM-7 to TPM-16 and it continues within this TQM series. The beginning of these series is in TPM-7:

- [English]
 - o TPM-7 page 31 One Lecture in a Company:
<https://archive.org/details/TPM7SeisoInJishuHozen/page/n29/mode/2up?view=theater>
 - o Previous lecture in TQM-3: <https://archive.org/details/tqm-3-hardware-software-diagnose-cost-reduction-6>
- [Spanish]
 - o TPM-7 page 31 Una conferencia en la Empresa:
<https://archive.org/details/TPM7SeisoEnJishuHozen/page/n29/mode/2up?view=theater>
 - o Lectura previa en TQM-3: <https://archive.org/details/tqm-3-hardware-software-diagnosis-reduccion-de-costes-6>



It was ROC (Return on Capital)

$$\text{Return on Capital} = \frac{(26) \text{Net Profit}}{\text{Total Capital}}$$

$$= \frac{(26) \text{ Net Profit}}{(1) \text{ Sales amount}} \times \frac{(1) \text{ Sales amount}}{\text{Total Capital}}$$

$$= \text{Sales Profit Rate} \times \text{Total Capital Turnover}$$

Return on capital (ROC), or return on invested capital (ROIC), is a ratio used in finance, valuation, and accounting, as a measure of the profitability and value-creating potential of companies relative to the amount of capital invested by shareholders and other debtholders. It indicates how effective a company is at turning capital into profits. And, the ratio is calculated by dividing the after-tax operating income (NOPAT) by the average book value of the invested capital (IC).

By SNS

I really felt "Oh dear! An additional difficult thing was brought in factory management. Anyway, it is not my matter." Even though I speak: —I see. And I confirm that you wish to recontract my teaching and at this time the theme is TQM. I'm right? —The answer of the Managing was positive.

—Still, I cannot understand why you wish to re-contract my teaching. Moreover, the teaching is TQM at this time. Of course, Quality improvement through TQM activity is essential for the continuation of a business and there is the effect of cost reduction (**Muda** reduction). However, your new policy is ROC improvement...

—To improve ROC, the improvement (increase) of Net Profit and/or improvement (decrease) of Total Capital. And, to improve the Net Profit, there are 2 ways which are an Increase in Sales amount and Cost (**Muda**) reduction. Thus, in order to improve, or decrease, the Total Capital, there are 2 ways, which are possible to implement as a factory.

—One is to sell unnecessary fixed assets (unnecessary equipment) or to change to leasing.

$$\text{Capital} = \text{Assets} - \text{Debt}$$

—Remember that of the "Assets", the money you can actually spend is the "Capital". When this "Capital" is exhausted, the business cannot be established. Another is to improve Inventory turnover to minimize the inventory. You are required to cascade the corporate policy into your factory. However, I felt it was like "Teaching fish to swim" for him. But it was necessary because it was important how to convey the top policy and replace it with the factory management themes. But even so, he wasn't feeling well that day.

—By the way —and then I asked him—: Are Katas of factory management (which I taught and are Management Team and regular review meeting, necessary indexes and data gathering, Gemba committees, etc.) being kept?

—Of course, yes. But my concern is Gemba —In the meantime, I felt: "My concern is you".

And he pointed out: that the Kaizen activity based on QC Circle was getting stuck in a rut and sluggish. They had a deadlock in finding the quality improvement theme and the implementation (even though they found the solution). And the 5Ss and Safety activity is continuing well.

—I see. It might be good. The maintenance of Kata (the step of "Shu") requires time.

—You told me about the concern of QC Circle —I detailed deeply—. And my view is that it is caused by the sustaining of the manager's mind. Gemba Kaizen is not like a temporal festival and campfire, but the fire of hearth. Somebody needs to keep it carefully.

—Somebody? —I asked myself— It is "Organization". And it is your task. You require managers to discuss and find solutions. They are competent. And I believe they can find the way what they need to do.

—TQM? —I also asked myself and I answered without waiting for him—. You can do it yourself, right? Also, it is a good time for additional campaigns after that TPM introduction activity. I taught TPM through the activities of PM (Preventive Maintenance) and Total involvement by the Katas. I think the order was against it. The order must be Factory Management by Kata first and secondly TQM and thirdly TPM ("Total" Preventive Maintenance). But anyway, I taught Factory management and TPM. So, What is your concern?... —I finally asked him.

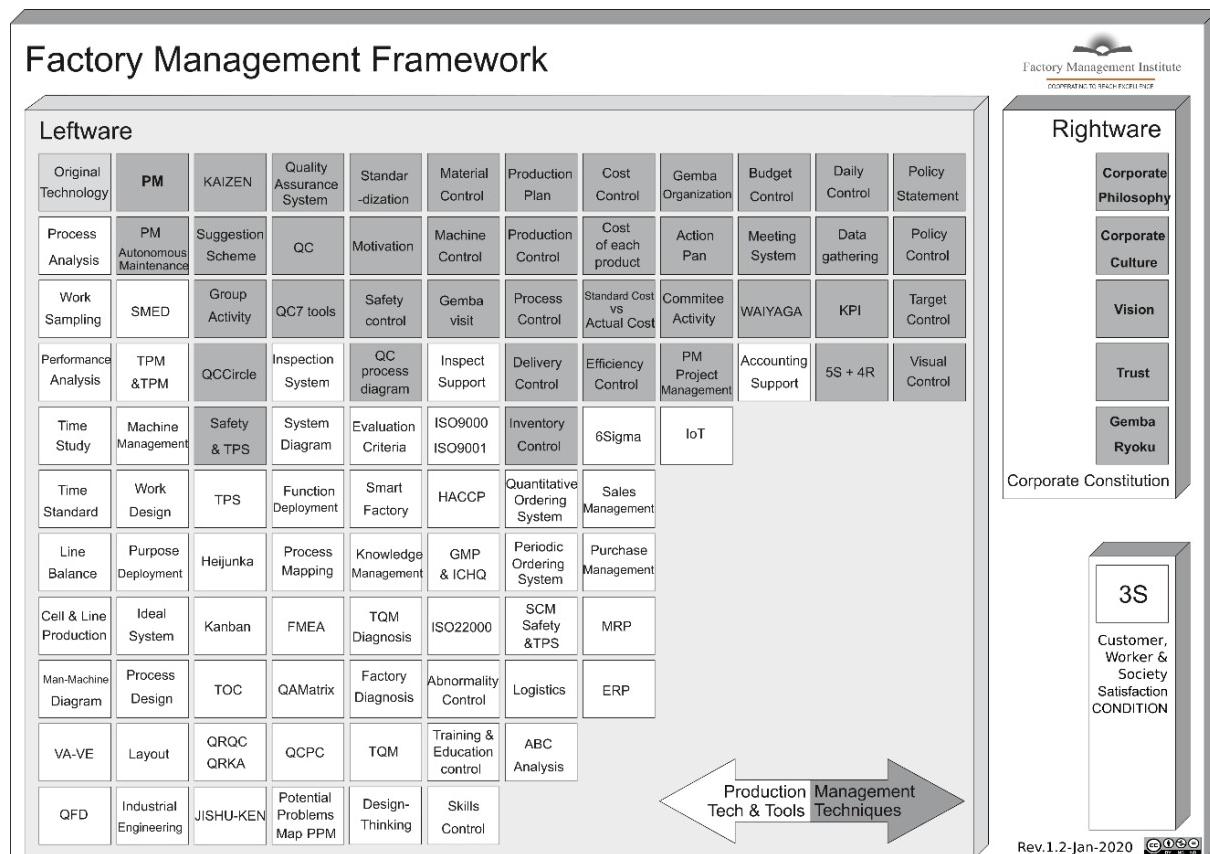
—My concern is the result as a company. The business achievement is not good and moreover is stagnating or declining.

I imagined so. And the sales expansion and sales amount didn't increase.

—I'm sorry —I however answered—, but I don't think that it is a corrective answer to implement TQM activity. It is quite true that quality improvement is useful to reduce cost by reducing Muda such quality cost and also is a good element for sales activity. But I think it is not possible to resolve your concerns such as sales amount and expansion.

—When looking at your company's core competence from R&D, Production, and Sales, your R&D has no problem (not say strong but), Production also has the capacity. But unfortunately, not sellable.

—And your company is very unique. Because still, you keep the stupid policy which disturbs the sales competence. When diagnosing a company, it is necessary to see it in multiple dimensions. One is such core competence in the market. Another is a strategy for future growth. And finally, there is Factory Management capacity.



—As you understand in factory management, TQM, TPM, Kaizen, and factory management itself such as meeting systems, Index control by data gathering and use, Gemba committee, Employee Engagement, etc. are involved.

—And my professional field is factory management. In here, you required me the re-contract and TQM teaching. But I don't understand what your ultimate aim to the re-contract and my teaching.

—I recognize that I already taught necessary Kata which is also a useful and basic condition to introduce any "Total" such as TQM, TPM, Kaizen and even TPS and also assets turnover improvement.

—Of course, and repeatedly I tell you that Kata must follow the steps of **Shu, Ha** and **Ri**¹¹ in the long term and experiences.



Shu, Ha, Ri in the Factory Management Learning Roadmap: WSFDP

¹¹ **Shu, Ha, and Ri** (守、破、離):

- **Shu (守):** **Shu** means to keep. Keeping **Kata**, which is taught by the teacher. Anyway, it is required to master the **Kata** which is like a Judo form. This step is still training level.
- **Ha (破):** **Ha** means to break. After keeping **Kata** taught, the next step is to analyze and study by himself and create better **Kata**.
- **Ri (離):** **Ri** means to leave. To understand the teacher's **Kata** and his own. **Kata** deeply. And, free from the teacher's **Kata** and his own **Kata** and break new ground including the philosophy.

Shu, Ha, Ri in the Factory Management Institute Learning Roadmap:

<https://archive.org/details/WFSDPRoadMap>

And then I called using his position: —Mr. Managing Director, I never refuse your invitation stubbornly. However, I don't want that condition at the time of TPM introduction. At that time, you strongly required me to introduce Total "Productive" Maintenance (or "Management"). But I refused it, because of JIPM TPM was so stupid. Secondly, I could understand that your ultimate goal was to recover the profit by reducing **Muda** in the factory.

—Then, I declared that my teaching is Total Preventive Maintenance and through it, teaching factory management Kata for the future. But it is also a fact that there were unnecessary conflicts between my teaching and the management team. It was indeed meaningless.

—Again, what is your wish, Mr. Managing Director? —And I answered myself— TQM introduction? You do it by yourself. Again, is it the profit recovery? —I asked to myself continuing my speech—. If it is, you already know one of the solutions, which is to stop the stupid policy.

—So, there are two ways to increase your recurring profit. One is increasing the sales, and another is reducing the costs. However, companies with a deteriorating rate of return on total capital such as your company will actually have little room to cut costs.

—No, it is wrong. There are some rooms for Inventory turnover improvement and unnecessary machine treatment. Unfortunately, it may not be the ultimate solution for your top policy, but one of the important factors. Then, another way to increase Ordinary income is to increase sales.

—However, in order to increase sales, it is common to increase sales volume by discounting, etc., but in this case, ordinary income may actually decrease.

—If you rely too much on discounts, you will be busy but not profitable, so you need to improve your marketing ability and make efforts to increase your sales power so that you do not have to sell at unreasonable discounts.

—Your Sales department considered this point by the Break-Even-Point Diagram and the market diagnosis. And they were trying this sales promotion, even breaking the policy of "Prohibition of receiving an order in red".

—Yes, it is —The Managing Director answered—. Our ultimate goal is to recover profit. But Kimura-san again TQM, TQM also has such effect of cost reduction. Am I right?

I was just a little irritated —Yes, you are. TQM or quality improvement has the effects of Muda reduction such as quality cost (inspection cost, inspection equipment, repair cost of labour & and material, quality claim treatment cost etc.) However and also, the market reputation is also very relevant.

—It is true that endless quality improvement activity is essential for a company. However, for your wish and final goal, the TQM is like as prescribing vitamins and cold medicine for the patient of stomach ache.

—It is necessary to improve quality for internal **Muda** reduction and is of course useful. However, when looking at your accounting data and also considering your new policy, indeed, the internal **Muda** reduction is never enough. Today, you look like not to be fine. I guess that the cause to be your plan in the deadlock.

—Your plan is still the dramatic sales expansion in the condition of the stupid policy. And, according to the sales & engineering market survey, your new products series have the technical competitiveness. But unfortunately, these excellent products series are too high price. I don't know the current competitiveness of this product series in the current market, because my image is already 5 or 6 months old. Maybe, you already lost the timing and chance to dominate the market.

—You told me the word of stupid policy repeatedly —He seemed just a little annoyed—. Why it is stupid? ...Is the policy "Prohibition of order in red" so stupid? ...I just obey the common sense of corporate management. It is quite natural to take such a policy for getting profit, isn't it?

—Common-sense? —I questioned surprisingly—. In Japan, there is the next word: "Japanese common sense is insane in the world". —Yes, there is this saying in Japan —. Also, there is the next word: "Accounting's common sense is insane in a factory" —However it is a lie because there isn't.

—Anyway, Mr. Managing Director, there is no more ambiguous word than so-called common sense. Your common sense is the common sense in just the world of Accounting.

—When making a factory management meeting (which the sales department and a person of accounting attended.) at my previous company, we diagnosed the trends of key indexes by graphs and charts and also monthly P/L statement. And the salesperson could understand the sales (price) competitiveness by the factory situation. Our discussion point is not the Operating profit (which includes the Period cost), but the improvement of Marginal profit. Our important discussion point is not the Period cost (which is the accumulation of past costs in the period result), but the current cost.

—Mr. Managing Director —I asked him—. You are leading your company to destruction. I saw you're provided with accounting materials. And the fact is the gradually declining of sales amount. And, I have taught the management team the importance of looking at the trends of key indexes as a ***factory management Kata***.

—On the other hand, there is no big change in organizational aspects. There was a little reduction in the number of direct labourers. But other General & Administrative Expenses were no change. Once you explained your company's strategy, which is to keep the factory capacity for future sales expansion.

—Mr. Managing Director, I believe your capacity as an accountant. And my previous company also kept the unwritten rule which a top person should be changed alternately between Accounting and technical fields to keep the balance.

Idle talk: Facts and Truths.

I somewhere I wrote: "An engineer talks about a dream, and an Accountant talks about numbers". For corporate management both are important. But as you understand, it is necessary to consider the balance.

And another contrast is: "The engineer understands the facts by actual occurrence. And the Accountant understands the facts with through numbers."

He required me to teach TQM. Still, I didn't understand what his will was. No, probably I had understood his wish, which was to complete the new policy (ROC; Rate on Total Capital).

By the way, TQM requires to see "facts", but not "truth". And to see "facts" is so difficult. Therefore, it is necessary the training.

And ...Training to see the facts? ...For instance, "dimension defect" occurred. The "fact" is just one and is the occurrence of a "dimension defect". And it is required to pursue the causes by (for instance) 5Whys. And the essential attitude is to seek and collect "facts". One "original fact" is the dimension defect occurred. And to analyze the causes, it is necessary to find all surrounding facts such as machine speed, degree of wear, variation of the material, temperature, surrounding vibration etc. And for helping this survey, the fishbone Diagram provides the basic branch by 5M elements (Man, Machine, Material, Money and Method) for beginner or low-level participants.

When teaching defect cause analysis, I teach to not pursue truth, but pursue facts. Determine if it is a "fact" or a "truth". "Facts" and "truths" have similar meanings, but their nuances are different. "Fact" refers to what actually happened, and "truth" contains a person's interpretation of that matter. "Facts" are objective, while "truths" are subjective.

It is a very difficult story to receive "facts" as "facts". Because, even if it is a "fact", for example, the moment you hear it from a person, the subjectivity will be included, and since the listener is also a person, the subjectivity will be included. In that sense, some training is required to distinguish between "facts" and "truths."

Most of the failures of 5WY, Fishbone is to fail to pursue just facts. And the essential attitude is never to pursue a subjective idea.

An engineer is trained in such behaviour unknowingly. But accounting is different. An accounting person is trained to look at the facts with thorough numbers. Thus, I'm an engineer basically. Therefore, I look at current phenomena by the facts of actual occurrence.

Going back to the dialogue with MD.

—It is so simple —I detailed—. The objective facts are: There is a market for the products. (Half a year before.) Production capacity is sufficient, but not saleable. The cause is the price. On the other hand, you (MD) look at these facts through numbers. And you say next: "For the company's management which must take care of future growth, and it is necessary to keep Operating profit".

—Both points of view are of course important. However, without the present, there is no future.

—Mr. Managing Director, I suggest you discuss with the members of the Sales department and Accounting manager based on the Break-Even-Point Diagram which they made.

—You wish to recover or improve the ROC.



It was ROC (Return on Capital)

$$\begin{aligned}
 \text{Return on Capital} &= \frac{(26) \text{Net Profit}}{\text{Total Capital}} \\
 &= \frac{(26) \text{ Net Ptofit}}{(1) \text{ Sales amount}} \times \frac{(1) \text{ Sales ammount}}{\text{Total Capital}} \\
 &= \text{Sales Profit Rate} \times \text{Total Capital Turnover}
 \end{aligned}$$

- To improve it, it is required to improve the Sales Profit Rate and Total Capital Turnover.
- To improve Sales Profit Rate, it is necessary to improve Profit Rate against Sales Amount. Therefore, you wish to keep the stupid policy "Prohibition of receiving order in red". However, one of serious facts is "Not saleable". You know this fact already. And therefore, you are troubled.
- Another truth is the cost recovery will be possible even in planned discount price by getting production volume.
- Well, Mr. Managing Director. Let's stop this talking, because it will be not may matter. Do you wish the re-contract of my consulting?
- Oh, yes, please.
- I confirm you. This consulting job is TQM and not the solution of ROC or Profit recovery. Is that Okay?
- Sensei —He called me again using the same recently promoted name—. When beginning a new contract, I have one request, which is to guide a project activity. I decided to establish a project team. As you know, we have experience in project management. However, only one project that succeeded was that former project. This project activity could be evaluated as a model of project management. However, unfortunately, this project was disbanded.
- But members are there, are they? —I asked him—. Why do you need me for a new project and the coaching?
- Showing a bitter face he concluded: —3 members in 5 were already gone to other companies. Therefore, no sufficient members are having that good experience. No, it is wrong. Some candidates have experience as project leaders.
- Disbanded and gone to another? How about that leader who is a staff accountant?
- Also left from my company. However, my impression was that other leaders experienced better leadership than her.
- What????? ...The former project was active for the goal of "JIT Machine Condition" with the establishment of Gemba Committee, Kaizen and could be succeeded. And you recognized their effort, did you?
- I'm evaluating their activity and also the leader's ability —He expressed.
- Mr. Kimura —The Managing Director detailed—. I'm also evaluating their good job. But it was finished. The main members were gone already. However, I'm never pessimistic, because there

are some candidates. Probably, You may be remembering the names of G or U or N. Especially G is a candidate for future middle manager and of course, has the experience of a project leader.

—Mr. Managing Director. When implementing a project activity, there are 2 things considered. One is the case of Clear Target (in the clear policy) and the way. Another is the case of Unclear Targets in vague conditions and unclear ways. The former project was this case (Unclear target), which is required to find a way with creative thinking. And she was a good leader and facilitator. What do you want?

The Managing Director looked some kind of confusing and then I answered: —Okay. Let's review a little of the former project (led by her). That case was started in chaotic circumstances.

—The beginning was "TPM introduction" based on the company policy. However, the true target was "Profit recovery". And this final goal (which is the company policy) and the countermeasure for this with Total Productive Management or Maintenance (which is also company policy) were clearly mismatched. Therefore, the introduction of TPM had the deadlock and stopped in half a year.

—The cause of this deadlock is very much understandable. Because the policy is vague, the target vague, and the method is also foolish. In such conditions, it is quite natural the TPM project failed early. There was another cause, which was the factory management system constituted of Gemba (Committee), Management team organization and Data gathering (KPIs) system. Then, a new project was begun with the new members in the chaotic circumstances. But you didn't take down the flag of TPM introduction and "Profit recovery".

—When I decided to do the coaching of this new project, I and the managers discussed the selection of members. And I met the candidates of leaders such G etc. And at that time, I was introduced to her (accountant staff and a group leader) by the Accountant Director and the HR Manager. I evaluated them (G etc. and her) and chose her as the leader of a new project. There were many objections to the selections. The member's selection was just considered the diversity.

—For me and them (project members), the project goal, policy and the method (top managers requested TPM still.) were in chaos. And as you know the result, they made up the base of factory management within Gemba, Organization and Data gathering system and support of (Transfer of outsourced production too) in-house production with the flag of "JIT Machine condition".

—Once again, the characters or capacity required of leaders are different in the character of the project:

- Case of Clear Target (in the clear policy) and the way. (Leadership capacity)
- Unclear Target or vague circumstance and unclear way. (Facilitator capacity)

—You lost a dear human resource.

—Nowadays, the qualities of a leader are changing. The image of a strong leader who can guide the team to a goal is avoided except in the case of a time pinch. Rather than a strong leader, a facilitator with the capacity for teamwork-keeping type is much more effective for the achievement of goals. She had such qualities. Anyway, she has gone away. So, Mr. Managing Director. What kind of project do you want?

We will continue in the next issue...

V. Next Lecture.

The use of KJ a little more. About "Diversity" and Teaching Company (continued).

Koichi Kimura, CC4 – August – 2023.

Factory Management Institute